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ABSTRACT

This annotated bibliography focuses on the effects of the physical environment on education. Topics covered include school size, architectural design, seating arrangement, environmental stressors, alternative learning environments, enhancing learning through environmental change, and special groups of students within the school. The first section of the bibliography contains brief annotations of journal articles and monographs. In the second section, references selected from the first section are reviewed in greater depth and summarized. This is one of a series of reports that form a part of the initial phase of a project to develop an ecological theory of teaching. The intent of this series is to provide access to the concepts, paradigms, and findings of the disciplines selected for review. The long-range goal of the project is the development of a theory of teaching that approaches and views classroom teaching and learning from an ecological perspective. (JD)

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ANNOTATED BIBLIOGRAPHY ON EFFECTS OF THE PHYSICAL ENVIRONMENT UPON EDUCATION

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Report ETT-78-6b

This paper has been produced under the direction of
William J. Tikunoff and Beatrice A. Ward,
Principal Investigators.
It is part of the process of developing
and implementing an ecological theory of teaching.

INTRODUCTION

This is one of a series of reports by the Far West Laboratory for Educational Research and Development concerned with developing an ecological theory of teaching. Under funding by the National Institute of Education, the project has been underway since December 1977 and is projected to continue contingent upon funding from NIE.

Overall long-range goals of the program are four. An initial goal is the development of a theory of teaching that approaches and views classroom teaching and learning from an ecological perspective. Such a perspective builds from knowledge about teaching/learning in the teacher-student learning group as a sociological as well as a psychological process. An underlying assumption is that, previously, only a psychological perspective has been attended to. Thus, disciplines outside educational psychology will be utilized, e.g. human ethology, sociology, anthropology, environmental psychology, human ecology, communications theory, etc., such that a holistic approach to developing the theory will be used.

Attendant to the theory construction and growing out of efforts to pilot test initial constructs and interrelationships is the development of appropriate research methodologies, the second long-range goal. Both qualitative and quantitative methodologies will have to be examined and those selected which provide a "fit" with the phenomena being examined. In addition, these will have to be piloted toward utilization in the testing of the theory.

A third goal is the development and implementation of strategies--both inservice and preservice--which can be used to train teachers and others to utilize the ecological perspective. Such strategies are perceived as being

more sociological in nature than those previously employed. In addition, it is quite likely that not only teachers but all those involved in interacting with teacher and learner groups--students, principals, other adults, etc.--will need to be reoriented to this perspective.

Finally, as a fourth goal, a restructuring experiment in nature is proposed in order to test the theory in operation. Exactly how the experiment will be designed and conducted is the focus for developmental efforts growing from both the development of methodologies and identification of theoretical constructs and (re) training strategies.

The annotated bibliographies and the longer reviews of selected references presented here are part of the initial phase of developing an ecological theory of teaching. The intent of this work is to provide access to the concepts, paradigms and findings of the disciplines selected for review, and to utilize the knowledge and perspectives of those disciplines to illuminate the concerns of an ecological theory of teaching. We see this process of cross-fertilization to be continuous and additive, and have designed the following format to reflect this assumption.

The results of each disciplinary exploration appear on different colors of paper: Cognitive Anthropology and Sociolinguistics (white); Environmental Psychology (brown); Human Ecology (yellow); Human Ethology (green); Sociology (ivory). The individual annotated bibliographies are paginated by topic; the longer reviews which make up the second part of this document are paginated by reference. There is no consecutive pagination, as we intend these bibliographies and reviews to be open-ended, and ready to receive future contributions.

The following annotated bibliography and longer reviews focus on the effects of the physical environment upon education. Topics covered include school size, architectural design, seating arrangement, environmental stressors, alternative learning environments, enhancing learning through environmental change and special groups of students within the school. The bibliography was assembled and the reviews conducted by Thomas McDonnell of the Department of Human Development and Family Studies, College of Human Ecology, Cornell University. We are very grateful for his efforts on our behalf. Invaluable guidance in this project was provided by Dr. Franklin D. Becker of the Department of Design and Environmental Analysis, College of Human Ecology, Cornell University. We are also grateful for his assistance.

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ANNOTATED BIBLIOGRAPHY

EFFECTS OF THE PHYSICAL ENVIRONMENT UPON EDUCATION

I. General Issues in Environment and Education

Bartholomew, R. The relationship between selected physical environment variables and the behavior of M.R. youth in a learning setting. Man-Environment Systems, 1976, 6, 183-184.
Plans for a project which will provide environmental data for use in developing and implementing positive learning experiences for mentally retarded youth are discussed. It is suggested that these data will also be applicable to environmental design for normal youth.

Becker, F., Sommer, R., Bee, J. & Oxley, B. College classroom ecology. Sociometry, 1973, 36, 514-525.
Three field studies were conducted in order to assess the amount of student participation in classrooms of various size and arrangement and to determine whether students perceived interest and performance in the class as a function of seating position. In the first study, utilizing a traditional classroom, class size was related to the proportion of students participating, but not to the actual amount of time devoted to class section. The second study occurred in a laboratory setting and revealed a high frequency of interaction among all class members. The third study, which focused upon a large lecture hall, revealed that position was related to performance, students' perception of interest, and perceived similarity and liking of the teacher.

Becker, H.S. A school is a lousy place to learn anything in. American Behavioral Scientist, 1972, 16, 85-105.
Various weaknesses in the American educational system are discussed, including inadequate teacher training, classroom environments that serve to inhibit learning, and lack of feedback.

Bronfenbrenner, U. Toward an experimental ecology of human development. American Psychologist, 1977, 32, 513-531.
The author advocates a broad approach to research in human development that focuses on the progressive accommodation between the developing organism and his/her changing environment. It is suggested that the environment includes not only the immediate settings, but also the larger social contexts within which these settings are embedded.

Drew, C.J. Research on the psychological-behavioral effects of the physical environment. Review of Educational Research, 1971, 41, 447-465.
Several research studies which have focused upon the effects of small-scale environmental change on subjects' behavior are reviewed. The implications of the findings of these studies for the creation of effective learning environments are also discussed.

Educational Facilities Laboratories. Evaluatirg buildings can lead to better schoolhouse design. Schoolhouse, 1976, 24, 1-8.
This newsletter offers a set of guidelines for evaluating school environments. Also included are discussions on open plan high schools, the use of solar energy in schools, and experiential learning exercises.

Gerst, M.S. & Moos, R.H. The social ecology of university student residences. Journal of Educational Psychology, 1972, 63, 513-525.
The development, standardization, and substantive data of the University Residence Environment Scales (URES) are discussed. A true-false, perceived environment scale composed of 10 subscales, URES was found to effectively discriminate among the 74 residences studied. Also presented were comparisons between dormitories and fraternities, and men's, women's and co-ed dormitories. Potential uses for URES in the areas of program evaluation, architectural design, and behavior change were discussed.

Getzels, J.W. Images of the classroom and visions of the learner. School Review, 1974, 82, 527-540.
This article examines both the architecture and underlying educational theory of four school buildings in the neighborhood of the author's office. The first, in which classrooms are rectangular in shape, the pupils' chairs are bolted to the floor in straight rows, and the teacher's desk is front and center, reflects a vision of the student as empty learner. The second, in which the classroom is square, desks are movable, and the teacher's desk is in a corner, is said to reflect a vision of the student as active learner. The third classroom is also square, but the desks are trapezoidal so that they can form a circle and there is no teacher's desk. The author concludes that this reflects a vision of the student as social learner. Finally, the fourth, designed as an "open classroom" is said to reflect a vision of the student as stimulus-seeking learner.

Gregg, W.E. Several factors affecting graduate student satisfaction. Journal of Higher Education, 1972, 43, 483-498.
In an investigation of graduate student satisfaction at a large mid-western university, it was discovered that: (1) the more collegial faculty-student relationships are, the higher the level of academic satisfaction; (2) the more competitive student-student relationships, the lower the level of academic satisfaction; and (3) for males, expectation-reality discrepancies are negatively related to academic satisfaction.

Gingold, W. The effects of physical environment on children's behavior in the classroom. Dissertation Abstracts International, 1971, 32, 2947A.

Hoffman, M. Nursery school rooms and their effect on children's involvement. Graduate Research in Education and Related Disciplines, 1976, 8, 54-87.
Five private nursery school classrooms and the degree of involvement exhibited by the children in those rooms during free play were observed. The classrooms were rated for quality through use of a modified form of an instrument designed by Prescott, Jones, and Kritchevsky for studying playgrounds. It was found that those rooms with higher ratings for space quality had a higher level of student involvement. It was also concluded that the instrument employed has high potential for use in designing and evaluating classrooms.

Hoyle, J.R. Organizational and spatial characteristics of urban learning environments. Journal of Educational Administration, 1977, 15, 124-132.
The relationship between learning climate, open instructional areas, instructional modes, student achievement, and similar variables is reviewed.

Lang, J., Burnette, C., Moleski, W. & Vachon, D. (Eds.) Designing for human behavior: Architecture and the behavioral sciences. Stroudsburg, Pennsylvania: Dowden, Hutchinson, and Ross, Inc., 1974.
Emerging issues in architectural theory and practice as reviewed in this book of readings. Also included are an evaluation of the methodology of architectural research and a discussion of psychological processes and environmental design.

Olson, M.N. Ways to achieve quality in school classrooms: Some definitive answers. Phi Delta Kappan, 1971, 53, 63-65.
Students in 112 suburban school districts throughout the United States were observed so as to assess the effects of eleven different variables on educational quality. Results indicate that style of educational activity, subjects taught, class size, grade level, type of teacher, number of adults, and day of the week all have a significant effect upon the quality of educational activity.

Randhawa, B.S. & Fu, L.L.W. Assessment and effect of some classroom environment variables. Review of Educational Research, 1973, 43, 303-322.
This article offers a general review of current research on the relationship between classroom environment and educational achievement. Included are discussion of the effects of subject matter, grade level, teacher sex, socio-economic status, and physical setting upon the learning process.

Rayder, N.F. & Body, B. The Educational Forces Inventory: Psychometric Properties. Journal of Experimental Education, 1975, 44, 35-44.
The validity of the Educational Forces Inventory, an instrument designed to chart the influence of elements in the educational setting from the point of view of the teacher, was assessed. It was suggested that the EFI is especially useful in uncovering situational, as opposed to psychological, variables affecting classroom behavior.

Ritter, P. Edurecreation: Education for creation, growth, and change. Oxford: Pergamon Press, 1966.
The concept, general implications, and specific applications to schools of architecture, environmental design, or ekistics are discussed.

Rosenfeld, L.B. Setting the stage for learning. Theory into Practice, 1977, 16, 167-173.
This review article discusses various classroom environmental factors, such as class size, noise, density. that can serve to promote or inhibit learning. General principles that may serve as a guide to developing effective classroom environments are also discussed.

Sommer, R. Classroom layout. Theory into Practice, 1977, 16, 174-175.
In this review it is argued that the arrangement and use of space are parts of the non-verbal communications system of a classroom. Because of this they affect the performance and behavior of both students and teacher.

Walberg, H. Physical and psychological distance in the classroom. School Review, 1969, 77, 64-70.
The purpose of this study was to examine the relationship between seating position and student personality. In order to accomplish this, 817 high school students enrolled in an experimental physics class were administered the Biographical Inventory. Results indicate that students who sit in the front of a class are more enthusiastic about school work and tended to place more value on learning, reading, and creativity than their peers.

Walberg, H.J. & Anderson, G.J. Classroom climate and individual learning. Journal of Educational Psychology, 1968, 59, 414-419.
This article describes a study in which 2100 high school juniors and seniors throughout the United States were examined in order to assess the relationship between classroom structural and effective climate and a variety of academic achievement tests. Results indicate at least 32 significant correlations between various classroom environment variables and learning. Possible implications for educators are discussed.

Wohlwill, J.F. The physical environment: a problem for a psychology of stimulation. Journal of Social Issues, 1966, 4, 29-38.
This article examines the effects of physical stimuli upon cognitive and emotional development and suggests that there may be an optimal level of stimulation at which development is maximally influenced.

II. School Size

Anderson, G.J. & Walberg, H.J. Class size and the social environment of learning: A replication. Alberta Journal of Educational Research, 1972, 18, 277-286.
The relationship between class size and the 14 scales of the "Learning Environment Inventory" was examined using 61 Montreal Secondary school classes in a variety of subject matter areas. Results indicate that cohesiveness and difficulty were significantly negatively correlated with class size. These results are discussed in relation to a variety of paradigms relating class size to classroom social environment.

Baird, L. Big school, small school: A critical examination of the hypothesis. Journal of Educational Psychology, 1969, 60, 253-260.
Both academic and non-academic achievements of students from small high schools were compared to those of students from large high schools. Results indicate that students from small high schools participate in a greater variety of college activities than those from large high schools. No significant differences were found in the academic achievements of students from small and large high schools. However, college achievement was negatively related to college size.

Barker, R. & Gump, P. Big school, small school. Stanford: Stanford University Press, 1954.
A study designed to measure the effects of high school size upon the behavior and experiences of students is described. Results indicate that although large schools had 20 times as many students as small schools, they had only 5 times as many settings and 1.4 times as much variety in settings. Also reported was the fact that large schools have a greater variety of extra-curricular activities but proportionately less participation.

Bass, B.M. & Norton, F.T.M. Group size and leaderless group discussions. Journal of Applied Psychology, 1951, 35, 397-400.
In an investigation of the relationship between group size and discussion patterns it was found that there was an inverse relationship between mean leadership assessment earned by participants and number of persons in a group. It was also found that relative satisfaction tended to increase directly with increases in discussion group size.

Beck, E.M. & Betz, M. A comparative analysis of organizational conflict in schools. Sociology of Education, 1975, 48, 59-74.
This article seeks to analyze conflict as a function of the organizational conditions of school size, teaching specialization, and the centralization of authority. It was reported that the major determination of intrastratum conflict in elementary schools was the centralization of authority, whereas in secondary schools it was primarily a function of school size. Interstratum conflict was seen as a function of all three variables in elementary schools, although school size was given some greater importance. In secondary schools, interstratum conflict was increased both by school size and the

centralization of authority, although specialization of teaching tended to diminish such conflict.

Bozzomo, L.L. Does class size matter? National Elementary Principal, 1977, 57, 78-81.
In general, it has been found that classes of fewer than 30 students are healthier and more productive for children. Educators are urged to consider this information when considering the class size issue.

Cashen, V.M. High school size as a factor in college academic success. Journal of Secondary Education, 1971, 45, 256-259.
Two hundred six first semester freshman at Illinois State University were compared in terms of their high school size and college GPA. Results indicate that students from small schools perform as well as students from large schools and that students from medium sized schools tend to perform best of all. It is suggested that the results are attributable to students from medium sized schools enjoying the combined advantages of both large and small schools.

Cope, R.D. Are students more likely to drop out of large colleges? College Student Journal, 1972, 6, 92-97.
The relationship between college size and size of high school was examined in regards to student dropouts from college. It was found that communities of less than 50,000 persons will furnish a significantly greater proportion of dropouts than will communities above that size. It was also found that students representing high school graduating classes of less than 200 have a significantly greater likelihood of dropping out than students coming from larger graduating classes.

Corwin, R.G. Innovation in organizations: The case of schools. Sociology of Education, 1975, 48, 1-37.
Over 30 variables were considered in relation to a measure of innovativeness of 131 schools. Among other significant findings reported was the fact that a school's innovativeness is directly related to its size.

Galloway, D. Big is not to blame. Times Educational Supplement (London), 1974, 3086, 15.
This article reports the results of a survey on the motivations of chronic absentees and the educational system's role in checking student truancy. Results indicate that school size was not a significant influence in determining absentee rates.

Galloway, D. Size of school, socio-economic hardship, suspension rates and persistent unjustified absence from school. British Journal of Educational Psychology, 1976, 46, 40-47.
After examining information from 30 comprehensive schools and their feeding primary schools about all children who missed at least 50 percent of possible attendances in the first half of the 1973 Autumn term it was concluded: (1) that truancy accounted for only a small

portion of unjustified absence in all age groups; (2) that no association existed between school size and number of unjustified absences; (3) that persistent absenteeism was closely associated with socio-economic hardship; and (4) that the number of children suspended from a school was associated neither with socio-economic hardship, school size, nor high absentee rates. It was concluded that suspension rates may not accurately reflect the amount or degree of deviant behavior in a school.

Grabe, M.D. Big school, small school: Impact of the high school environment. Dissertation Abstracts International, 1976, 36, 6550-6551A.

House, P.A. Learning environments, academic self-concepts, and achievement in mathematics. Journal for Research in Mathematics Education, 1975, 6, 244-252.
The effects of school size, organizational complexity, and student sex were examined in regards to how they affect self-concept and achievement in mathematics. Results indicate there exists a significant relationship between learning environments and academic self-concepts and suggest that both general and mathematical self-concepts of academic ability can be predicted from combinations of classroom environment characteristics.

Wicker, A.W. Undermanning, performances, and students' subjective experiences in behavior settings of large and small high schools. Journal of Personality and Social Psychology, 1968, 10, 255-261.
Juniors from both large and small high schools were interviewed regarding their subjective experiences in extra-curricular activities. Results indicate that experiences such as the feeling of being needed, feeling challenged, and the development of self-confidence are associated with "undermanned" activities. The greatest amount of variation in responses was attributable to student's not holding a responsible position.

Wicker, A. Cognitive complexity, school size, and participation in school behavior settings: A test of the frequency of interaction hypotheses. Journal of Educational Psychology, 1969, 60, 200-203.
Forty juniors from a large high school were compared to 40 juniors from a small high school in terms of their participation in school behavior settings and cognitive complexity. It was found that small school juniors entered a wider range of school behavior settings, had more performances in those settings, and scored better on a test measuring cognitive complexity.

Willems, E. Sense of obligation to high school activities as related to school size and marginality of student. Child Development, 1967, 38, 1247-1260.
Two field studies are described which examined 120 marginal and regular high school students' sense of obligation to non-class-school activities. It was found that marginal students in small schools reported as much sense of obligation as regular students,

whereas marginal students in large schools reported little, if any, sense of obligation. Theoretical and methodological implications are also discussed.

Wright, J.S. Factors in school attendance. Phi Delta Kappan, 1976, 58, 358-359.
In an examination of various factors affecting high school attendance it was found that school size, the percentage of required courses offered as phase electives, and the population density of the surrounding community all influence attendance rates.

III. Architectural Design

Cramer, R.J. Some effects of school building renovation on pupil attitudes and behavior in selected junior high schools. Dissertation Abstracts International, 1977, 37, 4735A-4736A.

Griffin, W.V., Mauritzen, J.H. & Kasmar, J.V. The psychological aspects of the architectural environment: A review. American Journal of Psychiatry, 1969, 125, 1057-1062.
Various studies are reviewed which attest to the importance of the architectural environment upon persons' psychological well-being. Particular attention is paid to the effects of environment upon psychiatric patients.

Gutman, R. Architecture and sociology. American Sociologist, 1975, 10, 219-228.
The author reviews current literature concerning the relationship between architecture and social groups and discusses various means by which architecture can be used to facilitate group interaction. Included is a discussion of architectural design and the educational process.

Holahan, C.J. Consultation in environmental psychology: A case study of a new counseling role. Journal of Counseling Psychology, 1977, 24, 251-254.
The psychological impact of design changes in the communal dining area of a high-rise dormitory was assessed. Based both upon self-reports of diners and upon behavioral observations, it was determined that the design changes were highly successful in improving opportunities for social contact, in increasing privacy, and in diminishing the institutional appearance of the setting.

McDonald, E.G. The windowless classroom is a controlled laboratory. National Education Association Journal, 1961, 50, 12-14.
The author contends that windowless classrooms eliminate glare, improve lighting, and assist students in focusing upon academic stimuli rather than events outside of the room.

Propst, R., Adams, J. & Propst, C. Facility influence on productivity. Ann Arbor, Michigan: Herman Miller Research Corporation, 1976.
This report describes a research experiment in which two conventional laboratory classrooms were converted to an experimental environment designed to support innovative programs. It was proposed that a more responsive environment with strong facility management would result in both improved educational proficiency and in more intense usage of building space. A year-long evaluation in which the performance of the experimental setting was compared with that of the same facility before renovation revealed that both hypotheses were true.

Sommer, R. Personal space: The behavioral basis of design. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1969.
This book offers a general review of the relationship between architecture and social psychology. Included is a critical examination of educational design.

Wilcox, B.L. & Holahan, C.J. Social ecology of the megadorm in university student housing. Journal of Educational Psychology, 1976, 68, 453-458.
The influence of high- versus low-rise building design on the psychological climate of university residence hall environments was examined. It was found that physical design features (building size and floor level) significantly affected the degree of commitment students felt for one another, their patterns of interaction and emotional support, and their levels of involvement in organizational functioning.

Winett, R.A., Battersby, C.D. & Edwards, S.M. The effects of architectural change, individualized instruction, and group contingencies on the academic performance and social behavior of sixth graders. Journal of School Psychology, 1975, 13, 28-40.
Architectural changes, individualized instruction, and group contengencies placed on academic work were applied to a disruptive sixth grade classroom. It was found that individualized instruction with group contingencies significantly increased academic production, significantly improved social behavior, and significantly changed the mode of teacher-student interaction. Individualized instruction alone had lesser effects, and the architectural changes had no effect upon academic production or social behaviors.

Zeisel, J. Sociology and architectural design. New York: Russel Sage, 1975.
Various ways in which architecture can meet the unique needs of various agencies and institutions are discussed. Included is a brief section on design for public schools.

Zifferblatt, S.M. Architecture and human behavior: Toward increased understanding of a functional relationship. Educational Technology, 1972, 2, 54-57.
Two third grade classes with similar levels of teacher competency, curriculum difficulty, and student motivation were compared. One classroom provided for cluster group work, teacher accessibility, comfort and ventilation, whereas the other did not. Results indicate that students in the former displayed longer attention spans, performed better at academic tasks, and were less likely to be disruptive. It was concluded that the architecture of this classroom was more conducive to the accomplishment of learning and social objectives than was that of the more traditional classroom.

IV. Seating Arrangement

Bass, B.M. & Klubeck, S. Effects of seating arrangements in leaderless group discussions. Journal of Abnormal and Social Psychology, 1952 47, 724-727.
The relationship between seating position and leadership status in group discussions was examined for 467 college students. Results indicate that students occupying end seats attained leadership scores approximately 5 percent higher than those occupying middle seats. Possible implications of these results for educators are discussed.

Gur, R.C., Sackeim, H.A. & Gur, R.E. Classroom seating and psychopathology: Some initial data. Journal of Abnormal Psychology, 1976, 85, 122-124.
Two hundred twenty-eight undergraudates were administered the Manifest Symptom Questionnaire, consisting of 124 questions eliciting self-reports on 65 psychiatric disorders. It was found that males who sit on the right side of college classrooms and females who sit on the left tend to report greater psychopathology than their peers. These results tend to support hypotheses suggesting a relationship between hemisphericity and psychopathology.

Hare, A.P. & Bales, R.F. Seating position and small group interaction. Sociometry, 1963, 26, 480-486.
Several sets of data from five-man laboratory groups are discussed which tend to suggest that both centrality of seating position and distance between members can be used to predict interaction patterns in a "task" session. In a "social" session members tend to talk to those next to them.

Houston, J.P. Amount and loci of classroom answer copying, spaced seating, and alternate test forms. Journal of Educational Psychology, 1976, 68, 729-735.
Two experiments investigated both the amount and loci of answer copying as it related to the spacing of students and the use of alternate test forms. In the first experiment spacing students in alternate columns of seats resulted in a significant decrease in answer copying. In the second experiment the use of alternate forms of the same examination did not result in any decrease in answer copying.

Howells, L.T. & Becker, S.W. Seating arrangement and leadership emergence. Journal of Abnormal and Social Psychology, 1962, 64, 148-150.
The authors proposed that seating position affects flow of communication which, in turn, affects leadership emergence. In order to test this hypothesis 20 groups of five subjects performed a problem solving task and ten rated group members on exhibited leadership. Seats were so arranged that two subjects sat opposite their three group mates. Results indicate that a significantly greater number of leaders emerged from the two-seat than from the three-seat side of the table.

Kinarthy, E.L. The effect of seating position on performance and personality in a college classroom. Dissertation Abstracts International, 1976, 37, 2078A.

Lewis, P.V. & Page, Z. Educational implications of nonverbal communication. Et Cetera, 1974, 31, 371-375.
This article examines nonverbal messages which affect various facets of education, including: (A) seating arrangement; (B) physical distance between instructor and students; (C) territoriality and personal space; and (D) scheduling of time. Both the importance of consistency between verbal and nonverbal messages and that of teachers' receiving training in nonverbal communication are emphasized.

Norum, G.A., Russo, N.J. & Sommer, R. Seating patterns and group task. Psychology in the Schools, 1967, 4, 276-280.
Variations in seating patterns in response to cooperative, competitive, and co-acting academic tasks were examined. Results indicate a clear tendency for the perceived interpersonal relationship between individuals to affect how they arrange themselves spatially.

O'Reilley, R.P. & Illenberg, G.J. Relationship of classroom grouping practices to diffusion of students' sociometric choices and diffusion of students' perception of sociometric choice. California Journal of Educational Research, 1971, 22, 104-114.
Students in classrooms organized by pupil teams for instruction were compared to students in conventionally structured classrooms in responses to an instrument designed to measure social diffusion along three lines: liking, school competence, and social power. Results indicate that classrooms organized by pupil teams were consistently less diffuse in social structure than were the more conventionally organized classrooms.

Pellegrini, R.J. Some effects of seating position on social perception. Psychological Reports, 1971, 28, 887-893.
In an investigation of the relationship between seating position and social perception it was found that occupancy of the head position was associated with: (1) talkativeness, (2) persuasiveness, (3) dominance, (4) leadership, (5) self-confidence, and (6) intelligence. The results were interpreted as indicating a "halo effect" reflecting cultural standards and traditions regarding the organization of social space.

Schwebel, A.I. & Cherlin, D.L. Physical and social distancing in teacher-pupil relationships. Journal of Educational Psychology, 1972, 63, 543-550.
In this investigation the behaviors of students who had been assigned seats in the front, middle, and back rows of 14 elementary classrooms were assessed. New seats were then assigned and a second set of measures was taken. Results indicate that teachers tend to assign seats in such a way as to minimize classroom disruptions, that children assigned to front row seats are more attentive to classroom activities than are their classmates in middle and back rows, and that assignment to seats in front positively affects the way in which students are perceived by their teachers and peers and the way in which pupils evaluate themselves.

Sherrill, D., Horowitz, B., Friedman, S.T. & Salisbury, J.L. Seating aggregation as an index of contagion. Educational and Psychological Measurement, 1970, 30, 663-668.
In an experiment in which students were asked to score their own exams it was discovered that cheaters tended to sit together.

Simmons, J.T. & Waski, B.H. Grouping strategies, peer influence, and free time as classroom management techniques with first- and third-grade children. Journal of School Psychology, 1976, 14, 322-332.
The effects of different procedures on classroom behaviors were investigated. These procedures included: (A) teacher-designated seating groups; (B) seating groups based upon sociometric data; (C) peer encouragement; and (D) free-time reinforcers. Results indicate that seating groups had no effect at either level, that peer encouragement was related to increased attending behavior at the third-grade level, and that the use of free-time reinforcers effectively increased attending behaviors at both levels.

Sommer, R. Classroom ecology. Journal of Applied Behavioral Science, 1967, 3, 489-502.
In an attempt to assess the effects of classroom seating patterns upon student participation 144 students enrolled in an introductory psychology class were subjects in an experiment in which classrooms were switched in mid-semester. In the seminar style arrangement, students sitting directly opposite the instructor participated more than those on the sides. In classrooms with straight rows, students in front participated more than those at the sides or in the back. The author contends that these results support the expressive contact hypothesis which related direct visual contact to increased interaction.

Steinzor, B. The spatial factor in face-to-face discussion groups. Journal of Abnormal and Social Psychology, 1950, 45, 552-555.
In an examination on the effects of seating arrangement upon the sequence of statements in a group discussion it was found that the greater the seating distance between two people, the greater the chance that they will follow one another verbally. Other factors influencing verbal sequence included content, frequency and length of remarks, and intent of the speaker.

Ward, C.D. Seating arrangement and leadership emergence in small discussion groups. Journal of Social Psychology, 1968, 74, 83-90.
The relationship between seating arrangement and leadership status and communication flow was investigated in five-man discussion groups. Seats were arranged in a circle with several empty seats inserted into the group. Results indicate that in intially unacquainted groups individuals facing the largest number of members talked most and were most likely to be judged as leaders by other group members.

White, M.A. & Hansen, M.D. Guidelines for achievement of learner satisfaction in gerontological short-term training. Educational Gerontology, 1976, 1, 193-197.
It is suggested that class size, seating arrangement, training methods, and participant motivation all contribute to learner satisfaction in gerontological training programs. Additionally, six guidelines for increased training effectiveness are suggested: (1) pre-assessed and structured environment; (2) planned group size; (3) planned seating arrangements; (4) discussion group utilization; (5) pre-assessed learner attitudes; and (6) continuous evaluation with necessary restructuring.

V. Environmental Stressors

A. General Stressors

Doles, R.D. The effects of stressor conditions on the test performance of high school students. Dissertation Abstracts International, 1974, 35, 2045A.

Wilkinson, R. Some factors influencing the effect of environmental stressors upon performance. Psychological Bulletin, 1969, 72, 260-272.
Six factors in the working situation were isolated as having particular influence upon the effect of environmental stressors upon performance. They are: (1) the duration of work on the task, (2) the familiarity of the operator with the stress and with the work he has to do under stress, (3) the level of incentive of the operator, (4) the kind of work he has to do, (5) the aspect of performance which is most important, and (6) the presence of other stresses in the working situation.

Glass, D.C. & Singer, J.E. Urban Stress. New York: Academic Press, 1972.
The effects of environmental stressors common to urban communities upon human intellectual and social functioning are discussed. Particular attention is paid to the deletarious effects of noise.

B. Noise

Blechman, E.A. & Dannemiller, E.A. Effects on performance of perceived control over noxious noise. Journal of Consulting and Clinical Psychology, 1976, 44, 601-606.
Forty college students were assigned proofreading and anagrams problems in a noisy setting. One-half were told that they could control the level of noise and one-half were told that they could not. Additionally, one-half were assigned to a constant noise condition and one-half to an increasingly noisy condition. Results indicate that those who believed they could control the noise level improved significantly at proofreading but not at anagrams.

Cohen, S., Glass, D. & Singer, J. Apartment noise, auditory discrimination and reading ability in children. Journal of Experimental Social Psychology, 1973, 9, 407-422.
The relationship between children's auditory and verbal skills and the noisiness of their homes was examined. It was found that children exposed to higher levels of noise intensity showed greater impairment of auditory discrimination and reading achievement than children exposed to more moderate levels of noise. Both auditory discrimination and length of exposure to noisy environments appeared to be mediating factors. Results were interpreted as documenting the existence of long-term behavioral after-effects in spite of noise adaptation.

Grosjean, L., Lodi, R. & Rabinowitz, J. Noise and pedagogic efficiency in school activities. Experientia, 1976, 32, 575-576.
In order to assess the influence of noise upon pedagodic efficiency, eight 13-year old students and eight teacher trainees were administered two types of tests in the presence of environmental noises at levels from 45 to 75 decibels. Results indicate a nocivity threshold at around 55 decibels for the students and at around 65 decibels for the teachers. In addition it was found that less advanced students suffered more from the interference of noise than did the advanced children.

Joiner, L.M. & Kottmeyer, W.A. Effect of classroom noise on number identification by retarded children. California Journal of Educational Research, 1971, 22, 164-169.
The effects of four classroom auditory environments (no noise, typical classroom background noise, typical classroom background noise plus noise episodes, and noise episodes) upon number recognition task displayed at 1/10 and 1/100 seconds were examined. A first order interaction between auditory environment and display rate was obtained, supporting earlier research findings indicating the suppressing effect of meaningful noise on performance. Earlier reports that the effects of noise were greater when display durations are increased were also supported.

Kassinove, H. Effects of meaningful auditory stimulation on children's scholastic performance. Journal of Educational Psychology, 1972, 63, 526-530.
The effects of meaningful auditory stimulation upon children's scholastic performances were assessed. Third and fourth grade children were observed as they worked independently on a series of self-paced addition and division problems, either in quiet or in the presence of auditory stimuli. Results indicate that the auditory stimulation in no way affected task performance. The author therefore concludes that great amounts of money should not be spent by either schools or parents in an attempt to eliminate moderate amounts of noise from a child's academic environment.

Nober, L.W. Auditory discrimination and classroom noise. Reading Teacher, 1973, 27, 288-291.
Research clearly demonstrates that auditory perception is adversely affected by noise. Because noise is always present in the environment the noise factor is purposely introduced into a variety of hearing tests. The Wepman's Test, however, has been standardized in a quiet environment, and, while commonly used to assess a child's auditory discrimination, may not serve as a valid index within normal classroom settings.

Nober, L.W. & Nober, E.H. Auditory discrimination of learning disabled children in quiet and classroom noise. Journal of Learning Disabilities, 1975, 8, 656-659.
This study examined the effects of classroom noise on both normal and learning disabled children's performances on an auditory processing task. Results indicated that learning disabled students

made significantly more auditory discrimination errors than normals and that both groups made significantly more errors in noise than quiet. No differences were reported in the degree to which noise adversely affected the two groups. It was concluded that auditory discrimination scores in quiet do not accurately reflect the expected value for the classroom.

Ollila, L.O. & Chamberlain, L.A. The effect of noise and object on acquisition of a sight vocabulary in kindergarten children. Alberta Journal of Educational Research, 1975, 21, 213-219.
The influence of classroom noise and two methods of presentation upon the rate at which kindergarten children learned four dissimilar words was studied. Results indicate that girls trained by the word-alone method under a no-noise condition performed significantly better than did girls taught under other conditions. No other significant differences were found.

Sherrod, D.R., Hage, J.N., Halpern, P.L. & Moore, B.S. Effects of personal causation and perceived control on responses to an adversive environment: The more control, the better. Journal of Experimental Social Psychology, 1977, 13, 14-27.
An experiment designed to assess the effects on reactions to adversive noise of three levels of personal control was described. Results indicate that on both an attention to detail measure which occurred concurrently with noise stimulation and on a post-noise measure of task persistence performance rates significantly increased as degree of control increased. Results were discussed in terms of Seligman's theory of learned helplessness and deCharms' theory of personal causation.

Slater, B.R. Effects of noise on pupil performance. Journal of Educational Psychology, 1968, 59, 239-243.
In an attempt to assess the effects of noise upon academic task performance, 263 7th-grade public school children were tested in quiet (45-55 decibels), average (55-70 decibels), and noisy (75-90 decibels) classrooms. Both white noise and noise typical of that experienced in schools were used. Results indicate that noise had no effect upon either speed or accuracy of performance.

Weinstein, N.D. Effects of noise on intellectual performance. Journal of Applied Psychology, 1974, 59, 548-554.
This investigation studied the effects of a realistic noise level (typing) upon subjects' performances in a proofreading task. Results indicate that those subjects exposed to noise were poorer at identifying grammatical errors, worked more slowly, and worked less steadily.

C. Crowding

Desor, J. A. Toward a psychological theory of crowding. Journal of Personality and Social Psychology, 1972, 21, 79-83.
Seventy subjects were presented with scaled-down rooms and human figures and instructed to place as many people as possible in the rooms without overcrowding them. Although room size was held constant, architectural features affecting interpersonal perception and room activity were varied. Results suggest that crowding is a result of excessive social stimulation and not merely the lack of space. It was also discovered that one's criterion of crowding tends to vary with ongoing activity.

Freedman, J.L., Klevansky, S. & Ehrlich, P. The effect of crowding on human task performance. Journal of Applied Social Psychology, 1971, 1, 7-25.
Three experiments are described in which groups of subjects performed tasks under varying degrees of crowdedness. Tasks ranged from simple to complex. Results indicate no significant effects of density on performance.

Goeckner, D.J., Greenough, W.T. & Mead, W.R. Deficits in learning tasks following chronic overcrowding in rats. Journal of Personality and Social Psychology, 1973, 28, 256-261.
Rats reared in crowded environments were compared to those reared in less crowded environments in terms of their performance on appetitive and adversive learning tasks. Results indicate that those reared under crowded conditions showed generally poorer performance on complex tasks. The two groups did not significantly differ on simpler tasks.

Griffitt, W. & Veitch, R. Hot and crowded: Influences of population density and temperature on interpersonal affective behavior. Journal of Personality and Social Psychology, 1971, 17, 92-98.
Exposure to conditions of high population density and high temperature were found to adversely affect human interpersonal affective behaviors. These results parallel those in animal literature and reflect a deterioration of "social relations" under conditions of overcrowding and high temperature.

Heller, J.F., Groff, B.D. & Solomon, S.H. Toward an understanding of crowding: The role of physical interaction. Journal of Personality and Social Psychology, 1977, 35, 183-190.
It was hypothesized that the frequent failure of crowding studies to demonstrate decrements in task performance as a function of density was primarily due to the omission of physical interaction from laboratory analogues of crowding. In order to test this hypothesis 117 male subjects were exposed to either high or low room density and high or low physical interaction levels. Results indicate that decrements in performance on cognitive and behavioral tasks occurred only in the high density-high interaction condition. It is suggested that the additional demands placed on attentional mechanisms and the goal blocking created by other subjects in this condition are possible mediators of these performance effects.

Kelley, E.J. Our overcrowded schools: Current programs and future prospects. College Student Journal Monograph, 1976, 10, 1-14.
This monograph reviews current literature on the effects of school crowding and discusses the potential impact of secondary school overcrowding upon student attitudes, behavior, and academic performance, and upon student-teacher-administrator interactions. Implications and a discussion of possible alternatives to school overcrowding are also considered.

Paulus, P.B., Annis, A.B., Seta, J.J., Schkade, J.K., Matthews, R.W. Density does affect task performance. Journal of Personality and Social Psychology, 1976, 34, 248-253.
Three experiments are reviewed which examine the independent effects of group size, room size, and interpersonal proximity on task performance. It was found that increasing group size, decreasing room size, and decreasing interpersonal distance all result in decrements in task performance. The effects of both group size and interpersonal distance were similar for males and females; however, those for room size were obtained only for males. These results pose a serious challenge to earlier reports that task performance is not affected by density.

Rowes, J.R., Trego, R.E., McGaffey, C.N. & Rawes, D.J. Personal space as a predictor of performance under close working conditions. Journal of Social Psychology, 1972, 86, 261-267.
Two experiments were described which assessed the relationship between personal space preference and task performance under crowded conditions. Results lend partial support to the hypothesis that persons with high personal space preferences are more likely to incur a larger decrement in performance under the stress of crowded conditions than are low personal space scorers. Possible educational implications of these findings were also discussed.

Rogers, J.A. Relationships between sociability and personal space preference at two different times of day. Perceptual and Motor Skills, 1972, 35, 519-526.
Measurements of sociability, emotional adjustment, and personal space preference were obtained for 100 undergraduate college students. Contrary to earlier studies, in this sample no relationship was found between the degree of sociability and preference for personal space. However, the amount of personal space preferred in the morning was significantly greater than that preferred in the afternoon for all subjects. Possible implications of these findings for educational planning are discussed.

Saegert, S., Mackintosh, E. & West, S. Two studies of crowding in urban public spaces. Environment and Behavior, 1975, 7, 159-184.
Two studies examining the various effects of crowded environments were described. Results indicate that people in high density situations learn less about their environments, have more negative feelings especially about themselves, have difficulty moving through and organizing a clear image of their environment, and are less able to carry out tasks successfully. The implications of these findings for environmental planners are discussed.

Shapiro, S. Some classroom ABC's: Research takes a closer look. Elementary School Journal, 1975, 75, 436-441.
In an examination of classroom efficiency in 17 elementary schools it was discovered that when pupils in a classroom number less than 16, a significant reduction occurs in the social complexity of child behavior. It was also found that pupil involvement was greatest when there was between 30 and 50 square feet of classroom space per pupil.

Sherrod, D.R. Crowding, perceived control, and behavioral after-effects. Journal of Applied Social Psychology, 1974, 4, 177-186.
A laboratory experiment was conducted in which subjects were asked to perform simple and complex tasks in rooms of different degrees of crowdedness. Although crowding had no immediate effect on these tasks, in a post-crowding session those subjects who had been exposed to high levels of crowding displayed significantly lower frustration tolerances.

Sommer, R. & Becker, F.D. Room density and user satisfaction. Environment and Behavior, 1971, 3, 412-417.
In a four year study of a single college classroom with varying degrees of crowdedness it was revealed that class size was directly related to the proportion of complaints, satisfaction with ventilation, and room size for both students and faculty. The authors concluded that it is necessary to develop theories of people in environments rather than of people and environments as separate entitites.

Worchel, S. & Teddlie, C. The experience of crowding: A two-factor theory. Journal of Personality and Social Psychology, 1976, 34, 30-40.
A two-step process for the experience of crowding was proposed. First, individuals become aroused by violations of their personal space; second, they attribute this arousal to other people in their environment. Based upon this model it was predicted that the experience of crowding can be reduced if individuals are distracted from making the attribution that their arousal is caused by other persons. In order to test this hypothesis interaction distance and density were varied separately. Additionally, in half of the conditions studied, pictures (attribution inhibitors) were placed on the walls of the experimental room, whereas in the other half walls were bare. Results indicate that interaction distance is more closely related to crowding than density and that the addition of pictures reduced the experience of crowding in class interaction situations. It was concluded that these results support the attribution analysis of crowding.

Zimit, C.N. & Schneider, C. Effects of group size on interaction in small groups. Journal of Social Psychology, 1969, 77, 177-187.
Twenty males in five discussion groups were observed during eight weekly one-hour sessions in each of four college years. Although group composition remained unchanged, group size varied from two to five members because of absences. Results indicate that as group

size decreased, average interaction increased. Furthermore, subjects' behavior in dyads was uniquely different from their behavior in larger groups in that they displayed less aggression and more support.

D. Atmospheric Conditions

Dockery, E.R. A study of the effects of atmospheric conditions related to teacher and students behaviors. Dissertation Abstracts International, 1976, 36, 5018.

Holmberg, I. & Wyon, D. The dependence of performance in school on classroom temperature. Educational and Psychological Interactions, 1969, 31, 1-20.
Fifty eight- and nine-year olds were exposed in class groups to room temperatures of 20, 27, and 30°C while performing a variety of academic tasks. In addition, 80 eleven- and twelve-year olds were tested under similar conditions in room temperatures of 20 and 30°C. Results indicate that significant decrements in performance due to heat occurred in both groups.

Holmberg, I. & Wyon, D.P. Systematic observation of classroom behavior during moderate heat stress. Educational and Psychological Interactions, 1972, 37, 14.
Three classes of nine-year old children were exposed to air temperatures of 20, 27, and 30°C while performing normal classwork. Observations revealed highly significant changes in the students' posture, clothing, and appearance with increasing air temperature.

VI. ALTERNATIVE LEARNING ENVIRONMENTS

A. General Issues

Barton, A. The hard-soft school. In G. J. Coastes (Ed.), Alternative learning environments. Stroudsbourg, Penn: Dowden, Hutchinson, and Ross, Inc., 1974.
Three different approaches to education are discussed: (1) the "hard" approach, in which rigid guidelines and traditional materials are valued; (2) the "soft" approach, in which education is more experimential and individualized; and (3) the "intermediate" approach which attempts to incorporate basic principles of each. It is suggested that both hard and soft approaches have advantages and that both should be part of every student's educational experience.

deCarlo, G.C. Why/How to build school buildings. Harvard Educational Review, 1969, 39.
This article questions the utility of traditional school structures and suggests that such structures offer only limited educational experiences. The author suggests that current concepts of the educational environment be broadened so as to facilitate learning in a variety of contexts.

Krovetz, M.L. Who needs what when: Design of pluralistic learning environments. In D. Stokols (Ed.), Perspectives on environment and behavior: Theory, research, and applications. New York: Plenum Press, 1977, 251-272.
This essay argues that it is unrealistic to assume that all students learn best in the same environemnts. Rather, it is suggested that schools offer a plurality of learning environments so as to allow teachers and students to function in environments conducive to their personal teaching and learning styles.

Watts, G.H. & McGaw, B. Innovation and research in education. Australian Journal of Education, 1977, 21, 189-201.
Significant academic innovations and research in Australia and New Guinea are reviewed. The authors also make numerous suggestions for further innovating public school systems.

B. Open Education

Allen, D.I. Student performance, attitude, and self-esteem in open area and self-contained classrooms. Alberta Journal of Educational Research, 1974, 20, 1-7.
Seven hundred ninety-two third- and fifth-grade students enrolled in either open-area or self-contained classrooms throughout British Columbia were compared in terms of their academic achievement, attitude toward school, and self-concept. The open-area environment was found to be associated with better language development at grade five level. No significant differences were obtained for either attitudes or self-esteem.

Day, [illegible] & Brice, R. Academic achievement, self-concept, and behavior patterns of six-year-old children in open classrooms. Elementary School Journal, 1977, 78, 132-139.
One hundred six-year old children from four classes differing in degree of openness were compared in regards to their academic achievement, self-concept, and classroom behavior. Results indicate that although no differences were found between groups in either academic achievement or self-concept, the classroom behavior of those students enrolled in open classes was rated as significantly better than that of their peers.

Educational Facilities Laboratories, Schools without walls. New York: Educational Facilities Laboratories, 1965.
The various advantages, disadvantages, and implications of "open plan" architecture, in which several grades share a large open space are discussed. Advantages listed included: (1) an increase in student-teacher and teacher-teacher interaction; (2) exposure to a variety of teaching styles; and (3) the option of forming multi-grade groupings for special interest study.

Friedlander, B.Z. Some remarks on "open education", American Educational Research Journal, 1975, 12, 465-468.
After reviewing recent findings on the effects of open classroom upon academic achievement, the author concludes that they should be offered as an alternative to but not a replacement for more traditional classes.

Grand, C. & Gold, R. Kindergarten and the open classroom. Childhood Education, 1975, 51, 211-212.
This overview examines the philosophy of traditional kindergarten education and presents parallels to the open classroom approach. Various questions and pradoxes implied by those parallels are also discussed.

Gully, B. & Norwood, E. Critical aspects of the open classroom. Education, 1976, 96, 207-208.
A potential guide for operationalizing open education in the classroom is presented. Particular attention is paid to four basic aspects of the open classroom concept: (1) the physical environment; (2) instruction, diagnosis, and evaluation; (3) the social and emotional environment; and (4) the role of the teacher.

Gump, P.V. Operating environments in schools of open and traditional design. School Review, 1974, 82, 575-593.
The distinguishing characteristics of both open and traditionally designed schools are discussed. It is concluded that open design schools offer greater flexibility, but can also lead to increases in nonsubstance time.

Halsted, D.L. Open classroom: A panacea. Educational Forum, 1977, 41, 487-491.
The author argues that the open classroom is less threatening than other role postures of the teacher. The student is therefore

more likely to direct his/her own learning experiences and will learn more fully and with less trauma than in more traditional settings.

Martin, L.S. & Pavan, B.N. Current research on open space, nongrading, vertical grouping, and team teaching. Phi Delta Kappan, 1976, 57, 310-315.
Current research tends to suggest that such innovations, when properly interpreted and implemented, may be a step toward educational improvement and are valid alternatives to traditional approaches to education.

Moore, R. Open space learning place: Schoolyards and other places as communal resources for environmental education, creative play, and recreation. In G. J. Coates (Ed.), Alternative learning environments. Stroudsburg, Penn.: Dowden, Hutchinson, and Ross, Inc., 1974.
The author describes two play areas in Berkeley, California, which are felt to provide sufficient richness, diversity, support, and choice as to promote individual growth among those using the facilities. It is believed that the more diversity that is offered the more likely it is that each person will find something of interest and the less likely it is that anyone will start disrupting someone else's play as a result of boredom.

Proshansky, E. & Wolfe, M. The physical setting of open education. School Review, 1974, 82, 557-574.
The classroom environment as a direct expression of a school's educational philosophy and as an active part of the educational process is discussed. Particular attention is focused upon the implication of an open-education philosophy for the design and use use of physical space.

Ramey, C.T. & Piper, V. Creativity in open and traditional classroom... Child Development, 1974, 45, 557-560.
Creativity scores of students enrolled in an open school were compared to those of age mates enrolled in traditional public schools. Results indicate that students enrolled in open schools scored higher on all measures of figural creativity whereas students enrolled in traditional schools scored higher on tests of verbal creativity.

Rathbone, C.H. (Ed.). Open education: The informal classroom. New York: Citation Press, 1971.
This book consists of a selection of readings that examines the practices and principles of the British infant schools and their American counterparts.

Sanders, S.G. & Wren, J.P. The open-space school - How effective? Elementary School Journal, 1976, 77, 57-62.
A variety of open space classrooms are examined in regards to their effects upon academic achievement, teaching techniques, affective factors, and teacher attitudes and characteristics.

It is concluded that this educational approach is more effective than the traditional self-contained classroom.

Sealey, L. Open education: Fact or fiction. Teachers' College Record, 1976, 77, 615-630.
In an effort to discover what happens in open classrooms and to learn about the theory behind the practice of open education, 10 open education schools were examined. Each is described and effort is made to integrate the basic guidelines of each into a model for open education.

Seidman, M.R. Comparing physical openness and climate openness of elementary schools. Education, 1975, 95, 345-350.
The purpose of this investigation was to (1) investigate the relationship between physical openness and climate openness, (2) determine whether organizational climate and operational life are related, and (3) identify staff behaviors that are responsible for climate. Results of 1,763 principals in open space elementary schools throughout the United States indicated: (1) that physical openness and climate openness are not related; (2) that organizational climate and operational life are not related; and (3) that teacher behaviors are largely responsible for climate. It is suggested that these results indicate that hiring and assignment practices should be re-evaluated and that pre- and inservice training for administrators and faculty should be established.

Simoes, A. The myth of the open classroom. Education, 1976, 97, 183-186.
The importance of a structured curriculum, the training of teachers, and architectural design were all analyzed with reference to the nature of the "viable" open classroom. It was concluded that the open classroom is not a totally free environment, but rather a democratic situation encompassed within a high structure and prescribed learning domain, in which students select their own educational program according to their interests. It is therefore emphasized that well-disciplined pedagogical principles are necessary to create a successful open classroom.

Traub, R.E., Weiss, J. & Fisher, C.W. Studying openness in education: An Ontario example. Journal of Research and Development in Education, 1974, 8, 47-59.
Thirty elementary schools were assessed in terms of their programmatic and architectural openness. Results summarized included the degree of association between the independent variables and teacher attitudes and interpersonal relations, student cognitive achievement, and student initiative, responsibility to self, and autonomy.

VonHilsheimer, G. Children, schools, and utopias. In G.J. Coates (Ed.), Alternative Learning Environments. Stroudsburg, Penn: Dowden, Hutchinson, and Ross, Inc., 1974.
The author contends that the structure of the American public education system is badly out of date, exacerbates the poverty of real persons in a child's life, and contributes to a growing sense of communityless society. A model for a more democratic approach to education is also discussed.

Weikart, D.P. Open framework: Evolution of a concept in preschool education. National Elementary Principal, 1972, 51, 59-62.
A preschool designed in accord to the basic principles of Piagetian theory is discussed. When compared to traditional schools in the same area it was determined that students enrolled in this school performed better on academic achievement tests. Implications for architects and educational planners are discussed.

Wright, R.J. The affective and cognitive consequences of an open education elementary school. American Education Research Journal, 1975, 12, 449-465.
One hundred fifth grade children were randomly assigned to either traditional or open classrooms. After two and one-half years those students enrolled in traditional classrooms scored significantly higher than those enrolled in open classrooms on nine tests of academic achievement. No differences between the two groups were noted with respect to either personality or cognition.

C. Cooperative Studies

DeVries, D. & Edwards, K. Learning games and student teams: Their effects on classroom process. American Educational Research Journal, 1973, 10, 307-318.
In an investigation of seventh grade math classes it was determined that learning games resulted in greater student-peer tutoring, less perceived difficulty of material, and greater satisfaction with the class. Student teams were found to result in increased tutoring, perceived mutual concern, and competitiveness; a combination of games and teams was found to result in a higher degree of peer tutoring than either used individually.

DeVries, D. & Edwards, K. Student teams and learning games: Their effects on cross-race and cross-sex interactions. Journal of Educational Psychology, 1974, 66, 741-749.
In an examination of the effects of student teams and learning games upon student interactions it was discovered that such activities had only a marginal effect upon cross-race interactions. Furthermore, the effects of such activities appeared to be largely limited to the game situation.

McClintock, E. & Sonquist, J.A. Cooperative task-oriencted groups in a college classroom: A field application. Journal of Educational Psychology, 1976, 68, 588-596.
Under individual reward conditions, sociometric groups were found more likely than random groups to function outside the classroom. Under shared reward conditions, both types of groups were equally likely to function outside the classroom. Although working in groups did not affect subsequent individual test performance, it was found that on a joint project teamwork resulted in better performance than individual efforts.

Wheeler, R. & Ryan, F.L. Effects of cooperative and competitive classroom environments on the attitudes and achievement of elementary school students engaged in social studies inquiry activities. Journal of Educational Psychology, 1973, 65, 402-407.
Eighty-eight fifth- and sixth-grade students were randomly assigned to one of three treatment groups: cooperative, competitive, or control. Members of the two experimental groups were exposed to the same social studies content for 18 days and worked on inquiry-related problems within subgroups (cooperative) or independently. Members of the control group did not receive the same instructional content. Results indicate that members of both experimental groups performed significantly better than control group members on achievement tests. Furthermore, it was found that members of the cooperative group liked social studies class, sharing information, working together, talking with one another, and receiving group grades significantly more than did members of the competitive group.

D. Individualized Instruction

Corley, G.B. & Lewis, C.W. The impact of individualized instruction on low achieving youth. Urban Education, 1975, 10, 321-326.
Thrity low achieving seventh-grade pupils were given individualized instruction in an open classroom atmosphere. None had previously been enrolled in such a program. Results indicate a significant increase in students' problem solving performances.

Dunn, R. Another look at individualized instruction. Phi Delta Kappan, 1977, 59, 400-402.
This article reports on an individualized instruction program which has resulted in enhanced scores on standardized tests of achievement in reading and mathematics.

E. Creative Environments

Baines, M.R. & Snortum, J.R. A time-sampling analysis of Montessori verses traditional classroom interaction. Journal of Educational Research. 1973, 66, 313-316.
First and fourth graders enrolled in a Montessori academy were compared to a matched group of children enrolled in a traditional school. Twelve behavioral measures yielded information in four general areas: type of task involvement, source of supervision for academic tasks, size of task group, and amount of physical movement within the classroom. It was reported that the classroom behavior of the Montessori and public school children coincided with the educational philosophy espoused by the two types of schools. Also reported was a tendency for older students to display behavior patterns reflecting greater personal autonomy.

Bingham-Newman, A.M. & Saunders, R.A. Take a new look at your classroom with Piaget as a guide. Young Children, 1977, 32, 62-72.
This article reviews the basic tenets of Piaget's theory and suggests several ideas, including group problem solving and individualized instructional materials, which have implications for the classroom learning environment.

Busse, T.V., Ree, M. & Gutride, M. Environmentally enriched classrooms and the play behavior of Negro preschool children. Urban Education, 1970, 5, 128-140.
In an investigation on the effects of environmental enrichment upon children's play habits it was found that boys in environmentally enriched classrooms engaged in more cooperative play than did boys in more traditional classrooms. No effects, however, were observed for girls. Possible implications of these results for educational planning are discussed.

Busse, T.V., Ree, M., Gutride, M., Alexander, T. & Powell, L.S. Environmentally enriched classrooms and the cognitive and perceptual development of Negro preschool children. Journal of Educational Psychology, 1972, 63, 15-21.
This study investigated the effects of the placement of additional equipment in preschool classrooms upon the cognitive and perceptual development of 123 Negro preschool children. Results indicate that this program elicited both desirable and undesirable effects, prompting the authors to question certain claims about the cognitive and perceptual value of play materials.

Coelho, G.V. Personal growth and educational development through working and studying abroad. The Journal of Social Issues, 1962, 18, 55-67.
This article suggests that study abroad offers students a rare opportunity to expand their cultural horizons, to enhance their self-esteem, and to facilitate psychological growth. Three studies are also reviewed which suggest that study abroad can result in reduction of racial prejudice and nationality stereotypes.

Cooper, C.C. Adventure playgrounds. In G.J. Coates (Ed.), Alternative Learning Environments. Stroudsburg, Penn: Dowden, Hutchinson, and Ross, Inc., 1974.
This article describes a recreational space in which children are encouraged to build their own environment under adult supervision. It is argued that this approach provides endless opportunities to explore and engage in creative play, thereby facilitating cognitive growth.

Shaw, J.D. The new conservative alternative. Nation's Schools and Colleges, 1975, 2, 31-34.
This article describes a new approach to public education, termed the "conservative alternative," which stresses discipline, achievement, and virtues.

Sommer, R. & Becker, F. Learning outside the classroom. School Review, 1974, 82, 601-607.
This article distinguishes "teaching" environments--which are characterized by fixed time-space coordinates with both implicit and explicit behavioral norms--from "learning" environments--which are characterized by a plethora of interesting, novel, and useful objects which are designed to be manipulated, measured, arranged, and experienced. It is suggested that as we become more fully aware of the relative advantages afforded by these environments, we can better decide what can best be learned in each.

VII. ENHANCING LEARNING THROUGH ENVIRONMENTAL CHANGE

Burts, E. Windows help to promote better classroom learning. NEA Journal, 1961, 50, 13-14.
This article suggests that windows diminish the effects of crowding, add beauty to a classroom, and provide numerous opportunities for observational learning.

Maslow, A.H. & Mintz, L. Effects of esthetic surroundings: 1. Initial short-term effects of three esthetic conditions upon perceiving "energy" and "well-being" in faces. Journal of Psychology, 1956, 41, 247-254.
In an experiment investigating the effects of esthetic surroundings upon people it was found that subjects' perceptions of fatigue/energy and displeasure/well-being of photographs tended to be directly related to the beauty of their surroundings. Various implications for research and environmental design were discussed.

Wilson, C.W. & Hopkins, B.L. The effects of contingent music on the intensity of noise in junior high home economics classes. Journal of Applied Behavioral Analysis, 1973, 6, 269-275.
Two seventh- and eighth-grade home economics classrooms were studied in order to determine whether the contingent presentation of popular radio music could effectively maintain classroom noise at an acceptable level of intensity. Results indicate that this policy was an effective means of controlling the noise produced by students.

Vernetti, C.J. & Jacobs, J.F. Effects of music used to mask noise in learning disability classes. Journal of Learning Disabilities, 1972, 5, 533-537.
Fifty-three children enrolled in classes for the learning disabled were examined in order to determine whether the use of classical music to mask background noise would result in enhanced academic performances. Results indicate no significant improvements in either accuracy or rate as a result of this program.

VIII. SPECIAL GROUPS OF STUDENTS WITHIN THE SCHOOL

Brimm, J. & Achilles, C.M. The reverse transfer student: A growing factor in higher education. Research in Higher Education, 1976, 4, 355-360.
An investigation of 195 reverse transfer students found that following a poor academic performance at a university, most achieved satisfactorily at two-year colleges. Those who later returned to universities typically improved their grades with each quarter's course work. Factors associated with academic performance at both types of institutions are identified.

Gotlieb, J. & Budoff, M. Social acceptability of retarded children in non-graded schools differing in architecture. American Journal of Mental Deficiency, 1973, 78, 15-19.
Integrated and segregated educable mentally retarded (EMR) children in a traditional school building were compared to EMR children in a no-interior-wall school in terms of their acceptance by non-EMR peers. Results indicate that although EMR's in the unwalled school were more apt to be known by their non-EMR peers, they were least likely to be chosen as friends and more apt to be rejected. It was also found that integrated EMR's were more often rejected than were segregated EMR's.

Gorton, C.E. The effects of various classroom environments on performance of a mental task by mentally retarded and normal children. Education and Training of the Mentally Retarded, 1972, 7, 32-38.
This study examined whether the performance of a mental task by brain injured mentally retarded children, cultural familial mentally retarded children, and normal children of comparable mental age would be differentially affected by various classroom environmental conditions. Results indicate that both normal and cultural familial mentally retarded children performend best when secluded visually. The brain injured retarded children, however, performed best when completely secluded. Since no differences in overall performance was found between the brain injured and cultural familial mentally retarded children, the important factor appears to be the type of environmental control.

Jansen, V.G. & Gallagher, J.J. The social choices of students in racially integrated classes for the culturally disadvantaged talented. Exceptional Children, 1966, 33, 221-226.
Sociometric choices of gifted disadvantaged children in four intermediate racially integrated classrooms were examined. Results indicate that numerous cross-racial choices were made, but that various factors such as sex and racial composition of the classroom appeared to influence the nature of these choices. The authors concluded that observed sociometric patterns did not justify generalizations regarding social structures in integrated classrooms beyond the statement that some cross-racial social choices can be expected for this age group.

Klitza, F. Report from Fairbanks: Informal teaching techniques. Journal of American Indian Education, 1972, 12, 12-15.
Based upon the assumption that native students from small villages learn best in informal learning environments, a program was designed in which 40 native students were enrolled in classes in which both classrooms and teaching techniques deliberately avoided traditional guidelines. Results tended to support the original hypothesis.

Saunders, B.T. Modification of emotionally disturbed behavior in the elementary school child through the manipulation of classroom seating. Dissertation Abstracts International, 1970, 31, 1088A.

Thibeault, R.J. The achievement of bus transported students. Journal of Teaching and Learning, 1977, 2, 17-22.
Forty high schools throughout Montana were examined in order to assess the effects of transportation time and school size upon student academic achievement. Results indicate that time spent on buses did not have a negative effect on learning but that the size of the school did have an effect.

SELECTED IN-DEPTH REVIEWS

SELECTED IN-DEPTH REVIEWS

From the preceding annotated bibliography, the Far West Laboratory staff has chosen selected references for longer in-depth reviews. These reviews appear on the following pages. To aid in the retrieval of relevant information, reviews are presented in the following format.

Bibliographic citation

1. Summary of the theory and/or main ideas in the book or article.

2. Major implications for a definition of teaching.

3. Major implications for studying teaching.

4. Categories and definitions given by the author.

5. How categories and definitions relate to the nine elements[1] presented below, or to interactions among/between any of these elements.

    1. Students
    2. Teachers
    3. Other human elements
    4. Role
    5. Time
    6. Place
    7. Task
    8. Standards and sanctions
    9. Communication

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1. Working definitions and a brief discussion of these elements appear in Dawson, M. B., Tikunoff, W. J., and Ward, B. A. Toward an ecological theory of teaching: A starting point. San Francisco: Far West Laboratory for Educational Research and Development, nd.

6. If the source is reporting a study, describe the following:

   a) Behavior

   b) Setting

   c) Treatment

   d) Data sources and data collection methods used

   e) Data analysis procedures used

Authors of the reviews were asked to use this format to structure their reporting, but not to force-fit the content of their sources to it; thus, not every point in the above outline is covered in every in-depth review. These longer reviews are paginated according to the reference being reviewed; there is no consecutive pagination.

Bass, B.M. & Norton, F.T.M. Group size and leaderless group discussions. Journal of Applied Psychology, 1951, 35, 397-400.

1. Summary: This investigation examined the effects of variations in group size of initially leaderless discussion groups on four major variables: 1) the mean leadership rating attained by participants; 2) the extent of stratification which developed; 3) the extent of agreement among raters; and 4) the consistency of participant behaviors. Twenty-seven groups of undergraduate college students, ranging in size from 2 to 12, were observed as they participated in 2 minute discussion sections. During each section 2 trained observers assigned each participant points based upon the exten to which he/she demonstrated 9 items of behavior deemed valid for identifying college leadership capacities. The total rating, based upon these assignments of points, could vary from 0 to 36. Results indicate:

    1. A significant decline in the mean leadership assessment earned by participants as the groups studied became larger in size.

    2. Maximum stratification occurred in groups of six, whereas relative stratification tended to increase directly with increases in discussion group size.

    3. Observer agreement reached a maximum in groups of 6 and tended to decline as group size was altered in either direction.

    4. Consistency of leadership behavior was at a minimum in groups of two and tended to be roughly equal for all other group sizes.

2. Major implications for a definition of teaching: Since this investigation focuses upon leaderless discussion groups, its implications for teaching are rather speculative. It does appear, however, that teachers wishing to encourage student leadership would be wise to limit discussion group size.

3. Major implications for studying teaching: Students' leadership behaviors were determined on the basis of direct observation. Two trained observers rated subjects on 9 items. These were: 1) effectiveness and clarity of speech; 2) the extent to which he offered good solutions to problems discussed; 3) initiative; 4) the extent to which he defined problems; 6) leadership; 7) the extent to which he influenced others; 8) interest in the discussion; and 9) knowledge of material. The score for each item could range from 0 to 4. Consequently, subjects' total score ranged from 0 to 36.

4. Categories: Leadership potential was the primary variable examined. Each subject's leadership potential was determined by his total score for 9 items of behavior found valid for identifying college leaders in a

previous study (Bass and White, 1951). Each subject received a total score between 0 and 36, believed to reflect the amount of leadership potential he possessed.

5. The nine elements:

1. Students: Students' leadership potential was found to be directly influenced by group size.

4. Role: The role taken by students (i.e. leadership) was directly influenced by group size.

6. Description of the study:

a) Behavior: Students' natural behaviors in groups of varying size were examined.

b) Setting: The setting of the investigation is not described; however, the fact that observers were able to observe and record the discussions without altering their course suggests that they may have used a laboratory setting with an adjacent observation booth.

c) Treatment: Treatment consisted of assigning subjects to 2, 4, 6, 8, or 12 member groups. Differences in leadership ratings, in stratification, in rater agreement, and in consistency of behavior were then examined in regard to how variations in group size affected each.

d) Data collection: Subjects were observed by two trained observers who assigned scores ranging from 0 to 4 on 9 items believed to indicate college leadership ability.

e) Data analysis: In order to determine the effects of group size upon leadership, observer agreement, and consistency of behavior various analyses of variance were used. The effect of group size upon extent of stratification was determined by using Bartlett's test for homogeneity of variance.

--Reviewed by Tom McDonnell

Source: Busse, T.V., Ree, M. and Gutride, M. Environmentally enriched classrooms and the play behavior of negro preschool children,

1. Summary: Sixty four black children from Philadelphia were randomly assigned to 6 Head Start classrooms. Three of these classrooms were "environmentally enriched" whereas the remaining three were not. All subjects were then observed in regard to their play and aggressive activities. Results indicate that the frequency of cooperative toy play among boys is inversely related to the frequency of parallel and cooperative play. The frequency of cooperative toy play for girls was directly related to the frequency of cooperative peer play and negatively related to the frequency of solitary play. Finally, it was found that boys in environmentally enriched classrooms engaged in more cooperative play than did boys in more traditional classrooms.

2. Major implications for a definition of teaching: Since this study focused only upon the effects of classroom enrichment, no implications for defining teaching can be drawn.

3. Major implications for studying teaching: The authors used the "Preschool Ovservation Schedule" for all observations. This instrument identifies 6 types of play behavior and 6 types of aggressive behavior.

4. Categories:

   Enrichment: For the purposes of this study classroom, enrichment consisted of the additon of a "substantial amount" of equipment and supplies chosen specifically to augment one or more of the following: verbal ability, performance ability, visual perception, auditory perception, and social interaction.

   Play: The authors identified five levels of play: solitary play, parallel play, cooperatieve toy play, cooperative peer play, and isolation.

   Aggression: Six levels of aggression were identified: personal physical attacks, taunting, threatening, destroying property of another's labor, usurping property, and no aggressive behavior. For the purposes of this investigation, however, this list was collapsed to designate only the presence or absence of aggressive behaviors.

5. The nine elements:

   1. Students: Male students' tendencies to engage in cooperative play were significantly enhanced by classroom enrichment. Similarly, the frequency of cooperative toy play among males was inversely related to that of solitary and parallel play, whereas for girls it was directly related to the frequency of cooperative peer play and inversely related to the frequency of soliatry play.

6. Place: The extent to which the classroom environment provided a wealth of educational equipment and supplies significantly affected boys' tendency to engage in cooperative play.

6. Description of the study:

a) Behavior: All data were based upon observations of natural behaviors.

b) Setting: Six Head Start classrooms located in Philadelphia were used.

c) Treatment: The effects of the addition of a "substantial amount" of equipment and supplies to the classroom environment was the event being studied.

d) Data collection: All data were based upon direct observation of classroom behaviors. The "Preschool Observation Schedule" was the primary guide for these observations.

e) Data analysis: Spearman rank-order intercorrelations were computed for each of the 5 play variables and aggression Mann-Whitney U tests were then used to evaluate differences between experimental and control groups.

--Reviewed by Tom McDonnell

Source: Desor, J.A. Toward a psychological theory of crowding. Journal of Personality and Social Psychology, 1972, 21, 79-83.

1. Summary: Three studies are described in which 70 college students were presented with scaled-down rooms and human figures and were instructed to place as many people as possible in the room without overcrowding them. In all three studies room size was held constant but architectural features affecting interpersonal perception and room activity were varied.

   In the first study it was determined that the addition of bisecting partitions in a room results in subjects placing significantly more figures in it. The second study replicated this finding and further indicated that the activity for which a room was intended (in this study either quiet reading or a cocktail party) also significantly affected the number of figures placed in it. In the third study, it was found that subjects placed significantly more figures in two-door than six-door rooms, and in rectangular than in square rooms of the same size.

   The results of these three studies are said to suggest that crowding is a result of excessive social stimulation, and not merely the lack of space, and that one's criterion of crowding tends to vary with on-going activity.

2. Major implications for a definition of teaching: Teachers who wish to diminish the effects of crowding would be wise to be sensitive to the space requirements of classroom activities, and to effectively incorporate partitions or other items designed to minimize the awareness of room density into classroom design when needed.

3. Major implications for studying teaching:

   Study #1. 10 female and 40 male college undergraduates were presented with 16 sealed-down rooms which differed in regard to the number, location and composition of bisecting partitions. Each subject was then instructed to place as many human figures in the room as possible without overcrowding them. Order of presentation was balanced across subjects, and each was tested individually. For each subject, the number of figures placed was recorded along with their positions and orientation.

   Study # 2. 10 male graduate students, 10 male undergraduate students, and 16 female undergraduate students were presented with five rooms which differed in regard to the presence or absence of bisecting partitions. Additionally, two of the rooms were described as intended for a cocktail party and three were described as intended for quiet reading. Again, order of presentation was balanced across subjects, and all subjects were tested individually. Number of figure places, figure position, and figure orientation were recorded.

Study # 3. 10 male and 10 female undergraduates were presented with twelve rooms which differed in regard to their number of doors (two versus six) and shape (square versus triangle). In all other regards this study was identical to the previous two.

4. Categories: Crowding was defined as that state at which a room is filled with, at least, the minimum number of people needed to produce discomfort. As such, it is directly affected by both:

   Ongoing activity: That event for which the room is being used.

   Design features: (e.g.: room shape, number and composition of partitions, number of doors) which affect one's perception of crowding.

5. The nine elements:

   1. Students: Students' perception of crowding is affected by both the nature of ongoing activity and by room design.

   6. Place: The design of the room (i.e., its shape, number of doors, number placement, and composition of partitions) was found to directly influence subjects' perception of crowding.

   7. Task: The nature of the activity for which a room was used was also found to directly influence subjects' perception of crowding.

6. Description of the study:

   a) Behavior: All behavior was manipulated. Subjects were asked to fill scaled-down rooms which varied in regard to on-going activity and design, with figures until they reached the point of crowdedness.

   b) Setting: All investigations took place in the laboratory. Subjects were placed in a room which contained various scaled-down rooms and human figures, and were instructed in the manner described earlier.

   c) Treatment: Treatment consisted of varying the scaled-down rooms in regard to both design features and on-going activity.

   d) Data collection: Data collection consisted of counting the number of figures placed in each room. Additionally, figure position and orientation were recorded.

e) Data analysis: All three studies relied upon analyses of variance to determine the nature of the relationship between crowding, design, and activity.

--Reviewed by Tom McDonnell

Source: Freedman, J.L., Klivansky, S., and Ehrlich, P. The effect of crowding on human task performance. Journal of Applied Social Psychology, 1971, 1, 7-25.

1. Summary: Three experiments are described in which groups of subjects performed tasks under varying degrees of crowdedness. In all three studies, room density was varied by using rooms of 160, 80, and 35 square feet and by placing either 9 or 5 subjects in each room. In the first experiment, 126 high school students were asked to perform 7 sorting tasks under varying degrees of crowdedness. Results indicated no significant effects of density on performance.

   In order to determine whether these findings were the result of subjects being required to perform too many tasks in too little time, a second study was conducted which was identical to the first except that subjects were asked to perform only 3 tasks. Again, however, no significant effects were found.

   Finally, in order to eliminate the possibility that these results were due to a heightened tolerance for crowding among high school students, a third study was conducted which was identical to the second except for the fact that subjects were 180 women between the ages of 25 and 60. Again, no significant effects were obtained.

   Based upon these findings, the authors conclude that room density should not be viewed as necessarily a social evil, but rather as a logistical problem which can be eliminated with careful planning.

2. Major implications for a definition of teaching: Although these studies do not focus upon teachers, it seems reasonable to conclude that the careful management of classroom space can help to eliminate the deleterious effects of crowding.

3. Major implications for studying teaching: In all three studies, subjects were asked to perform sorting tasks under varying conditions of crowdedness. In order to assure that reults obtained were solely the product of room density, both the number of sorting tasks and the age range of subjects varied from one study to another.

4. Categories:

   1. Task performance was defined as the speed and accuracy with subjects performed the assigned sorting tasks.

   2. Room density was determined by placing either 5 or 9 subjects in rooms of either 35, 80, or 160 square feet.

5. The nine elements:

   1. Students: Students' ability to perform sorting tasks was unaffected by crowding.

6. Place: The degree of crowdedness had no significant effect upon subjects' ability to perform sorting tasks.

6. Description of the study:

a) Behavior: All behaviors reported were manipulated. Subjects were assigned to rooms which varied in degree of crowdedness and asked to perform sorting tasks.

b) Setting: Laboratory rooms of 35, 80 and 160 square feet were used. Into these rooms were placed either 5 or 9 subjects who were then instructed to perform timed sorting tasks.

c) Treatment: Subjects participated in sorting tasks under varying conditions of crowdedness. Room density was varied by varying both room size and room population.

d) Data collection: All subjects turned in their finished work in the sorting tasks. Trained assistants then analyzed this work according to both speed and accuracy.

e) Data analysis: In all three studies, the effects of crowding upon task performance were determined by analyses of variance.

--Reviewed by Tom McDonnell

Source: Getman, R. Architecture and sociology. American Sociologist, 1975, 10, 219-228.

1. Summary: This article reviews current literature concerning the relationship between architecture and the social system within which it exists. Particular attention is focused upon three critical issues that have traditionally vexed sociology in its study of the physical environment. These are:

    1. How to define architecture or the built environment so that it will reveal its connection to the social, cultural, and psychological elements in the social system.

    2. How to determine the types of behavior most likely to be influenced by the character of the building.

    3. How to determine the mechanism through which the environment exerts its influence.

    It is the author's belief that the sustained emphasis upon these issues reflects both a tendency among architects to view the relationship between the environment and architectural design within an overly deterministic model and a social-psychological bias in which the concern for man-environment relationships is phrased in terms of impact upon the individual. Rather, he suggests that, instead of asking how it is possible for the environment to influence behavior, we ask what is the social function of the environment and what part it can play in resolving problems that emerge on the social system level. In concluding, however, he concedes that this question is not easily answered and will require many additional years of continued investigation.

2. Major implications for a definition of teaching: This article did not focus upon teaching, but rather was a theoretical consideration of the relationship between architecture and sociology. Consequently, no major impressions for teacher can be advanced.

3. Major implications for studying teaching: Since this article was a review of existing literature, and not a report of an actual investigation, no implication for research methodology can be drawn.

4. Categories: Two major concepts regarding architectural planning are discussed:

    A. Programming is the process through which the requirements of the clients and users are investigated and set forth.

    B. Design is the name given to the process through which the form and characteristics of the building are developed in response to the information given in the program.

5. The nine elements:

   1. Students: The needs, interests, and goals of students should be considered in designing all educational buildings. Design should vary according to the age level and course of study for which a particular building or room is intended.

   6. Place: Architectural design should reflect the combined needs of both teachers and students. Consequently, it should vary from one classroom to the next. Moreover, it should do more than merely influence individual behavior; rather, it should facilitate group interaction and social skills as well.

--Reviewed by Tom McDonnell

Source: Getzels, J.W. Images of the classroom and visions of the learner. School Review, 1974, 82, 527-540.

1. Summary: This article examines both the architecture and underlying educational theory of four school buildings in the neighborhood of the author's office. The first, in which classrooms are rectangular in shape, the pupils' chairs are bolted to the floor in straight rows, and the teacher's desk is front and center, reflects a vision of the student as empty learner. The second, in which the classroom is square, desks are moveable, and the teacher's desk is in a corner, is said to reflect a vision of the student as an active learner. The third classroom is also square, but the desks are trapezoidal so that they can form a circle and there is no teacher's desk. The author concludes that this reflects a vision of the student as social learner. Finally, the fourth, designed as an "open classroom" is said to reflect a vision of the student as stimulus-seeking learner.

2. Major implications for a definition of teaching: The major implication of this article is that both student and teacher behaviors are directly related to the structure of the classroom. Teachers are urged to be cognizant of their educational goals and to arrange their classrooms so as to facilitate their achievement.

3. Major implications for studying teaching: All information discussed in this report is based upon direct observation of classroom environments.

4. Categories: Four major types of classrooms were identified:

    1. The rectangular (teacher centered) classroom in which chairs are permanently arranged in straight rows and the teacher's desk is front and center.

    2. The square classroom in which chairs are moveable and the teacher's desk is in the corner.

    3. The circular classroom in which student desks are moveable and trapezoidal and in which there are no teacher's desks.

    4. The open classroom in which students are free to move from one learning area to another.

    Additionally, four major conceptions of the child as learner are discussed.

    1. The empty learner conception maintains that the child is cognitively an empty organism who learns when specific responses are connected with specific stimuli through the mediation of pleasure or pain.

2. The active learner conception holds that the child is a cognitively complex and dynamic organism who plays an active role in determining his or her educational environment.

3. The social learner conception suggests that children learn through interpersonal actions and reactions, with each person in a classroom serving as a stimulus for every other person.

4. The stimulus-seeking learner conception maintains that the child is intrinsically constituted to explore, to think, to learn, to speculate, and to seek out problems to be solved.

5. The nine elements:

1. Students: Students' classroom behaviors and learning responses are directly influenced by the organization of their classrooms. Those enrolled in rectangular classrooms are apt to learn in a passive manner whereas those enrolled in open classrooms are likely to actively seek out and explore learning opportunities.

2. Teachers: Teachers' vision of the learning process is reflected in their choice of classroom organization. Those who view learning as a unidirectional process in which teachers disseminate information to students are likely to choose a rectangular classroom design. Conversely, those who view learning as a social experience are more likely to select a circular design.

6. Place: The design of a classroom is said to reflect both the teacher's theoretical perspective and the students' approach to learning.

--Reviewed by Tom McDonnell

Source: Hoffman, M. Nursery school rooms and their effect upon children's involvement. Graduate Research in Education and Related Disciplines, 1976, 8, 54-87.

1. Summary: Five private nursery school classrooms and the degree of involvement exhibited by children in those classrooms during freeplay were observed. Involvement was assessed by measuring the frequency of non-involvement during freeplay. Each classroom was also rated for quality through the use of a modified form of an instrument designed by Prescott, Jones, and Kritchevsky. This instrument was designed to measure various elements of the play area such as boundaries, pathways, complexity, variety of equipment, and amount to do per child. Results indicate that those rooms with higher ratings for space quality had a higher level of student involvement. It was also concluded that the instrument employed has high potential for use in designing and evaluating classrooms.

2. Major implications for a definition of teaching: Teachers are advised to carefully evaluate and modify the quality of their school environment so as to maximize student involvement.

3. Major implications for studying teaching: Five nursery school classrooms were rated for quality through the use of a modified form of an instrument designed in 1967 by Prescott, Jones, and Kretchevsky for evaluating playgrounds. Each classroom was also visited four additional times during which an ovserver noted the number of uninvolved children in th room. This number was then expressed as a percentage of the number of children in the room. After 24 separate 5-minute observation periods, a mean percentage was calculated which was then used to compare one classroom to another, and to see if there there was any relationship between quality of the play area and children's involvement.

4. Categories: Quality of room space was measured through use of a modified form of an instrument designed by Prescott, Jones, and Kritchevsky (1967). It consists of five main sections, each examining a different aspect of the play area. These are: 1) the degree of organization; 2) the variety of equipment; 3) the complexity of equipment; 4) the amount to do per child; and 5) special problems.

   Student involvement was determined through observation. For the purposes of this study, a child was considered uninvolved if:

   a) he is wandering aimlessly, passively, watching, sleeping, gazing out the window, and so forth;

   b) he is behaving disruptively;

   c) he is conversing to an adult or child about something unrelated to the play area, or he is just hanging around an adult, or

   d) he is taken up in disorganized running or horseplay.

5. The nine elements:

    1. Students: Students' involvement in preschool play activities is directly influenced by the quality of their play environment.

    6. Place: The quality of a play environment (i.e., organization variety, complexity, quantity, etc.) directly influences the involvement of students. In general, the higher the quality of the playground, the greater the level of student involvement.

6. Description of the study:

    a) Behavior: All behaviors were natural. Students were not manipulated, but rather observed as they participated in free play at their regular shcools.

    b) Setting: All students were observed under natural circumstances in their own classrooms.

    c) Treatment: Five nursery schools of varying quality of room space were compared in terms of the degree of involvement displayed by students during free play.

    d) Data collection: Classroom quality was assessed through use of a modified form of an instrument designed by Prescott, Jones, and Kritchevsky (1967). Student involvement was assessed through natural observation with particular attention paid to the four criteria described in section 4.

    e) Data analysis: Data analysis consisted simply of comparing classrooms of differing quality of room space in terms of the amount of student involvement observed. The exact statistical methods used were not, however, reported.

--Reviewed by Tom McDonnell

Source: Howells, L.T. and Becker, S.W. Seating arrangement and leadership emergence. Journal of Abnormal and Social Psychology, 1962, 64, 148-150.

1. Summary: The authors proposed that seating position affects flow of communication which, in turn, affects leadership emergence. In order to test this hypothesis, 20 groups of five subjects performed a problem-solving task, and then rated group members on exhibited leadership. Seats were so arranged that two subjects sat opposite their three group mates. Results indicate that those subjects sitting on the two-seat side were consistently rated higher on leadership than those sitting on the three-seat side. The authors conclude that these findings indicate support for their hypothesis.

2. Major implications for a definition of teaching: Since this study did not examine teachers, no implications for defining teaching can be drawn. It does, however, appear that teachers wishing to enhance the leadership potential of a student can do so by seating him/her in such a position that the flow of communication will support this goal.

3. Major implications for studying teaching: A typical experimental design was employed with seating position (two- versus three-seat side) as the independent variable and leadership rating as the dependent variable.

4. Categories:

   Seating arrangement: Students were assigned to either a two-seat or a three-seat row of chairs. No other variations occurred.

   Student leadership: This was determined by the ratings and the individual was assigned by his fellow group members.

5. The nine elements:

   1. Students: Students leadership ratings were directly affected by their seating assignment. Those assigned to two-seat rows received significantly higher leadership ratings than did those assigned to three-seat rows.

   6. Place: Students assigned to either a two- or a three-seat row significantly affected their leadership ratings.

6. Description of the study:

   a) Behavior: All behaviors reported were manipulated. Leadership ratings were found to be directly influenced by seat assignment.

b) Setting: All behaviors occurred in a laboratory setting. In the center of the room was placed a 6' x 3' table with two chairs on one side, and three on the other.

c) Treatment: Treatment consisted of assigning subjects to either the two- or three-seat row, and then observing how this assignment affected leadership ratings.

d) Data collection: All data were based upon subjects' ratings of fellow group members on various characteristics related to leadership.

e) Data analysis: A chi-square analysis of data was used in determining that students seated in two-seat rows were rated significantly higher in leadership than were those seated in three-seat rows.

--Reviewed by Tom McDonnell

Source: Norum, G.A., Russo, N.J., and Sommer, R. Seating patterns and group task. Psychology in the Schools, 1967, 4, 276-280.

1. Summary: Two studies are described which examine the relationship between group task and seating arrangements. In the first, 8 pairs of preschool children and 74 pairs of elementary school children (grades 4-6) were asked to create a design from logo blocks under three different conditions. In the coaction condition, each subject was asked to create a separate design for which each was told (s)he would be rewarded. In the cooperation condition, each subject was asked to work independently. In this case they were told that only that person who created the best design would be rewarded. In each case the manner in which pairs seated themselves around a 66" x 30' table was recorded. Results indicate that subjects involved in cooperative task were likely to arrange themselves side-by-side, whereas those involved in competition tended to seat themselves in a corner arrangement, and those involved in a coactive task typically arranged themselves in a catty-corner arrangement.

   In the second study, 4-7 undergraduate psychology students were examined as to how they seated themselves in relation to a decoy around a 66' x 30" table. Half of the subjects were told that the task they were to perform was competitive in nature, and half were told that it was cooperative in nature. In no case, however, were subjects actually required to perform a task. Results indicate that subjects involved in a competitive task were significantly more likely to sit opposite one another than were subjects involved in a cooperative task (who tended to sit side-by-side).

2. Major implications for a definition of teaching: Since this article does not directly address itself to teaching, few implications can be drawn. However, it appears that it can be concluded that a responsive teacher would allow the classroom seating arrangement to vary according to the types of tasks with which students are involved.

3. Major implications for studying teaching: In all cases, subjects' positions in relation to one another were recorded. Treatment conditions were determined by informing each subject of the type of task (i.e., coactive, cooperative, competitive) in which (s)he was to participate. In the first study rewards consisted of tootsie rolls for preschoolers and praises for the elementary school children.

4. Categories:

   Group tasks were divided into three types: coactive, in which subjects worked independently from one another but were informed that they would be equally rewarded; cooperative, in which subjects worked together on the same project and were informed that they would be equally rewarded, and competitive, in which subject pairs worked independently of one another and were told that only the subject creating the "best" design would be rewarded.

Seating arrangements were divided into four types: side-by-side, corner-seating, opposite seating, and catty-corner seating. Each type was also assigned a rank number based upon the degree of intimacy it reflected; therefore, side-by-side seating received a rank of 1, corner seating a rank of 2, opposite seating a rank of 3, and catty-corner seating received a rank of 4.

5. The nine elements:

   1. Students: Students' choice of seating arrangement is significantly affected by the type of task in which they are involved. Those involved in cooperative tasks choose intimate seating arrangements, whereas those involved in either coactive or competitive tasks prefer less intimate arrangements.

   7. Task: Task significantly affects students' preference in seating arrangments. Those involved in a cooperative tasks prefer intimate seating arrangements, whereas those involved in coactive or competitive tasks prefer less intimate arrangements.

6. Descriptions of the study:

   a) Behavior: Students' seating behavior was manipulated by informing them that they would be performing a task either independently (coactive), cooperatively, or competitively with one another.

   b) Setting: In all instances a 13' x 20' laboratory containing a 66" x 30" table surrounded by six chairs was used.

   c) Treatment: Subjects were informed of the type of task to which they were assigned (coactive, cooperative, or competitive), and asked to sit at the table and await further instructions.

   d) Data collection: In all cases, subjects seating patterns in relation to one another were observed and recorded.

   e) Data analysis: In the first study, average closeness score based upon the rank order described earlier, was computed for each task. An analysis of variance was then used to determine the effects of task upon closeness.

In the second study all subjects sat either across from or on the same side as the decoy. Consequently, a chi-square was used to determine the relationship between task (cooperative vs. competitive) and seating arrangement (side-by-side vs. opposite.)

--Reviewed by Tom McDonnell

Source: Ollila, L.O. and Chamberlain, L.A. The effect of noise and object on acquisition of a sight vocabulary in kindergarten children. Alberta Journal of Educational Research, 1975, 21, 213-219.

1. Summary: The influence of classroom noise and two methods of presentation upon the rate at which kindergarten children earned four dissimilar words was studied. 120 children were randomly assigned to four groups of girls and four groups of boys, each containing 15 subjects. These groups were then assigned separately to each of the noise conditions: noise and no noise, and to the two methods of presentation: word alone and word-object. The rate at which each subject learned four dissimilar words was then recorded. Results indicate that there were no differences favoring either method of presentation. However, the combination of word-object presentation and classroom noise was found to significantly depress the performance of girls, but not that of boys. In general, the performance of boys was not affected by the presence of noise, irrespective of presentation method.

2. Major implications for a definition of teaching: The authors suggest that classroom teachers should recognize that an important determinate in the learning process may be the interrelation between the noise level in the room and the particular instructional materials employed.

3. Major implications for studying teaching: This study had as its independent variables presentation method and noise level. Equal numbers of subjects were in each of the four possible cells (word alone, noise; word alone, quiet; word-object, noise; and word-object, quiet). The dependent variable was the rate at which subjects learned four dissimilar words.

4. Categories:

   Noise level was divided into two types: 1) quiet, in which the noise level was kept below 20 decibels; and 2) noisy, in which the noise level was maintained at 70 decibels.

   Presentation method was also divided into two types: 1) word alone in which students were taught a word by itself; and 2) word-object, in which each word taught was accompanied by a representation of the word.

5. The nine elements:

   1. Students: Rate of acquisition for all students was unaffected by presentation method. Furthermore, rate of acquisition for boys was unaffected by noise level. Among girls taught by the word-object presentation method, the presence of noise had a negative effect upon rate of acquisition.

6. Place: The presence of noise in the environment did not affect boys; however, it was found that girls taught by the word-object method were inhibited in their performance by noise.

6. Description of the study:

a) Behavior: All behaviors were manipulated. Students were taught word recognition by varying methods and while exposed to varying levels of noise.

b) Setting: All proceedings took place in a small medical office attached to the school.

c) Treatment: Treatment consisted of exposing subjects to different teaching methods and different noise levels to determine the effects of these variables upon the rate of acquisition of sight vocabulary.

d) Data collection: All data were based upon the number of trials subjects required to correctly recognize four dissimilar words.

e) Data analysis: Data analysis consisted of an analysis of variance by planned orthogonal comparisons.

--Reviewed by Tom McDonnell

Source: Paulus, P.B., Annis, A.B., Seta, J.J., Schkadi, J.K., and Mathews, R.W. Density does affect task performance. Journal of Personality and Social Psychology, 1976, 34, 248-253.

1. Summary: Three experiments are described which examine the independent effects of group size, room size, and interpersonal proximity on task performance. In the first, 120 college undergraduates performed maze tracing tasks under varying conditions of interpersonal closeness, room size, and group size. Results indicate that both group size and proximity were highly significant in affecting performance on this task. The effects of room size approached significance.

   In the second study 60 college undergraduates performed the same maze tracing task in groups of four in either large or small grooms. Results indicate that room size significantly affected both speed and accuracy. Furthermore, it was found that males tend to make more mistakes in small rooms whereas females tend to make more errors in large rooms.

   In the third study 56 college undergraduates performed the same maze tracing tasks under conditions of either close or far interpersonal distance. Results indicate that both males and females perform best under conditions that allow greater interpersonal distance.

2. Major implications for a definition of teaching: Since this study did not focus upon teachers, no implications for defining teaching can be drawn.

3. Major implications for studying teaching: College undergraduates were asked to perform maze tracing tasks under varying conditions of room size, group size, and interpersonal space. Speed and accuracy of maze tracing was used as the measure of performance.

4. Categories:

   1. Room size was described as either large or small. The large room had 96 square feet of space whereas the small room had only 48 square feet. In all other respects, the rooms were identical.

   2. Group size was either 2, 4, or 8. In this study, it was found that subjects worked best in groups of four.

   3. Interpersonal distance was defined as the amount of space left between subjects as they worked on the task. In the close interpersonal space condition, subjects sat in adjacent chairs. In the far interspersonal space condition, subjects had at least one chair's breadth between them.

4. Task performance was defined as the speed and accuracy with which subjects performed the maze tracing task.

5. The nine elements:

1. Students: Students' performances on maze tracing tasks were found to be significantly influenced by interpersonal space, room size, and group size.

6. Place: The size of the room was found to significantly affect both the speed and accuracy of performances on the maze tracing task.

6. Description of the study:

a) Behavior: All behaviors were manipulated. Students performed maze tracing tasks under varying degrees of crowdedness.

b) Setting: All subjects were tested in a laboratory setting. Rooms were either 48 or 96 square feet in size. Placed in the middle was a table with either 4 or 8 chairs arranged around it.

c) Treatment: Treatment consisted of alternately varying room size, group size, and interpersonal distance, and instructing subjects to perform maze tracing tasks.

d) Data collection: This consisted of recording the speed and accuracy with which subjects performed the maze tracing task.

e) Data analysis: All three studies relied upon analyses of variance. In the first study, room size, proximity, and interpersonal distance were the major factors examined. The second and third study employed 2 x 2 designs with room size and sex of subject (study #2) and interpersonal distance and sex of subject (study #3) as between factors.

--Reviewed by Tom McDonnell

Source: Rosenfeld, L.B. Setting the stage for learning. Theory into Practice, 1977, 16, 167-173.

1. Summary: This review suggests that education is much like theatre in that set, color, lighting, music, heating, clothing, and body type all contribute to the total experience. It is suggested that traditional classroom environments have neglected the importance of these factors and serve to hinder students' involvement with themselves, each other, and the world around them.

2. Major implications for a definition of teaching: Good teaching requires more than the mere presentation of factual material; it also requires that the instructor manipulate the classroom environment in such a way as to make learning an exciting and joyous experience.

3. Major implications for studying teaching: The author draws upon his experience in theatre to suggest ways in which the educational experience can be enhanced. No actual methodology is described as the report is merely speculative.

4. Categories: The article focuses upon seven major factors affecting the educational experience:

    A. The set: It is suggested that students learn best in comfortable classrooms. Windows, spaciousness, flexible seating arrangements, and decoration are all seen as essential to the development of a creative, intellectual environment.

    B. Color: The color of a room can have a profound effect upon its inhabitants' moods and productivity. It is suggested that rooms be painted so as to maximize interest and minimize distractions. It is further suggested that classroom color be varied according to both the course of study and grade level for which it is intended.

    C. Lighting: The author contends that the daylight, fluorescent and cool white lighting commonly used in American classrooms create a cold, detached atmosphere. He suggests that both the color and intensity of lighting be varied according to the activity and occupants for which a classroom is intended.

    D. Music: It is suggested that music is an effective means of increasing production, reducing errors, tension and absenteeism, and combating fatigue. It is further suggested that the effective use of music can facilitate concept and skill learning, mental imagery, reading efficiency, and such creative abilities as painting.

    E. Heating: It is suggested that classroom temperatures be maintained between 64° and 68° as cooler temperatures are more healthful and produce less fatigue.

F. Costumes: It is suggested that teachers choose a costume that fits the character (themselves), the play (curriculum), and the setting (classroom). Clothes which make teachers appear comfortable, and which are similar to those worn by their students can enhance teacher credibility and remove some of the barriers which often interfere with the learning experience.

G. Body type: Although not as easily manipulated as other aspects of the classroom environment, teachers' body types can clearly affect students' reactions. Instructors are urged to be aware of such responses and to attempt to create an impression consistent with their expectations and perceptions of their role.

5. The nine elements:

1. Students: Students' attention, enjoyment, and productivity are all seen as being affected by the seven variables described.

2. Teachers: Teachers are urged to manipulate these variables in such a way as to maximize students' enjoyment and productivity.

6. Place: The set, color, lighting, presence or absence of music, and temperature are all seen as having a direct affect upon students' academic performance.

--Reviewed by Tom McDonnell

Source: Schwebel, A.I. and Cherlin, D.L. Physical and social distancing in teacher-pupil relationships. Journal of Educational Psychology, 1972, 63, 543-550.

1. Summary: In this investigation fourteen elementary classrooms were observed in order to determine the effects of seat assignment on teacher-pupil relationships. Initially, the behaviors of students who had been assigned seats in the front, middle, and back rows of classrooms were assessed. New seats were then assigned and a second set of measures was taken. Results indicate that teachers tend to assign seats in such a way as to minimize classroom disruptions, that children assigned to front row seats are more attentive to classroom activities than are their classmates in middle and back rows, and that assignment to seats in front positively affects the way in which studnets are perceived by their teachers and peers, and the way in which the pupils evaluate themselves.

2. Major implications for a definition of teaching: Teachers need to examine their seating arrangments and consider whether such arrangements either reflect their own biases or contribute to the perpetuation of such biases.

3. Major implications for studying teaching: Two trained assistants, who were unaware of the authors' hypotheses, observed and recorded student attentiveness in 14 elementary classrooms. Additionally, teachers in each classroom were asked to rate the pupils who had been observed in four dimensions: 1) attentiveness; 2) disobedience and disruptiveness; 3) likeableness; and 4) participation.

   Manipulation procedure: All teachers were told that new seating plans would be assigned to "meet the needs of the children". In actuality, however, the children were randomly assigned new seats.

   Postmanipulation procedure: All classrooms were again observed in regard to student attentiveness and all teachers were again asked to rate observed children on the same four dimensions described earlier. In addition, observed students were also asked to complete a two-page questionnaire which included the following:

   1. Sociometric probes in which respondents named classmates who were most and least attentive.

   2. Questions about seat location preference.

   3. Questions designed to elicit respondents' feelings about themselves and to determine whether self-view was related to seat assignment.

   Finally, each teacher was interviewed about the techniques she/he has used with inattentive, disruptive and shy pupils, and about seating arrangements and the effects the investigation had on pupils' behavior.

4. Categories:

   1. Student attentiveness was determined solely on the basis of behavioral observations. The exact criteria for labelling a child attentive or inattentive was not described.

   2. Teacher perceptions of students' attentiveness, disruptiveness, shyness, and likeableness were based upon teacher ratings.

   3. Student perceptions of peers' attentiveness, disruptivenss, shyness and likeableness were based upon questionnaire responses.

   4. Student perceptions about their seating preference and student feelings about themselves were also based upon questionnaire responses.

5. The nine elements:

   1. Students' attentiveness was directly related to their seating assignment. Students' self-image was similarly affected. Additionally, students' perceptions of their peers were also affected by seating assignemnt.

   2. Teachers were reported to assign seats in such a way as to minimize classroom disruptions. Additionally, it was reported that teachers' percpetions of student attentiveness, shyness, and likeability were significantly affected by seating assignment.

   4. Role: students assigned to seats in the front of the classroom were significantly more attentive than were those assigned to seats in the middle and back rows.

   6. Place: The location of a students' seat was significantly related to his/her attentiveness and self-image. Additionally, it significantly influenced the way (s)he was perceived by both peers and teachers.

6. Description of the study:

   a) Behavior: All behaviors observed occurred under natural circumstances. Additionally, both students and teachers participated in interview sessions.

   b) Setting: All observations occurred within students' regular classrooms. Interviews took place in a vacant office in the school.

c) Treatment: Treatment consisted of reassigning seats and examining whether this affected students' behaviors, students' perceptions of themselves and their peers, and teachers' perceptions of student behaviors.

d) Data collection: Student attentiveness was measured by direct observations. Student and teacher perceptions of behavior and teacher reasoning for seating were all determined through individual interviews.

e) Data analysis: The extent to which seating arrangement affected student attentiveness and the extent to which both student and teacher perceptions were influenced by seating arrangements were all analyzed through the use of analysis of variance. Additionally, the extent to which the direction of seat change (forward or backward) affected changes in these ratings was determined by chi-square analyses.

--Reviewed by Tom McDonnell

Source: Shapiro, S. Some classroom ABC's: Research takes a closer look. Elementary School Journal, 1975, 75, 436-441.

1. Summary: Two hundred seventy-four 4-year-olds enrolled in 17 half-day nursery schools were observed in order to assess how they were affected by variations in the student-teacher ratio, total class enrollment, classroom size, and classroom organization. Results indicate that the number of contacts between students and teachers is greatest when the student-teacher ratio is approximately 8:1. It was also found when the total number of students in a classroom falls below 16, there occurs a significant drop in the complexity of children's behavior; when, however, the total number of students exceeds 20, the addition of more teachers does not increase the number of student-teacher contacts. Fi - nally, it was also reported that pupil involvement was greatest when there was between 30 and 50 square feet of classroom space per pupil, and when the classroom was organized in an orderly fashion.

2. Major implications for a definition of teaching: Teacher effectivness is maximized when there is a relatively low teacher-student ratio, relatively small numbers of students, and moderately spacious and organized environments.

3. Major implications for studying teaching: All data were based upon the author's observations of student behavior in 17 half-day nursery school settings.

4. Categories:

   Child-teacher contacts: The author distinguishes two types of contacts: individual, which is purely personal and experienced by the child alone, and group in which the teacher addresses several students at once.

   Child involvement: The author defines involvement as all behaviors not included in the following three categories: 1) deviant or disruptive behavior; 2) random, unfocused behavior; and 3) on-looking.

5. The nine elements:

   1. Students: The number of contacts students make with teachers and the extent to which they involve themselves in classroom activities are both affected by classroom size, classroom organization, number of students, and student-teacher ratio.

   2. Teacher: The student-teacher ratio was found to significantly affect the amount of teacher contact experienced by children and the degree of social complexity reflected in their behaviors.

6). Place: Classroom size and organization were both found to affect students' degree of involvement in classroom activity. Allowing between 30 and 50 square feet of floor space tends to maximize student involvement as does providing well defined and organized activity spaces.

6. Description of the study:

a) Behavior: All behavior described was natural.

b) Setting: All observations took place in 17 nursery school settings.

c) Treatment: Variations in classroom behavior as a function of space, population, and student-teacher ratios were observed.

d) Data collection: All data are based upon naturalistic observations of classroom behavior.

e) Data analysis: No data analyses were described.

--Reviewed by Tom McDonnell

Source: Slater, B.R. Effects of noise on pupil performance. Journal of Educational Psychology, 1968, 59, 239-243.

1. Summary: In an attempt to assess the effects of noise upon academic task performance, 263 7th grade public school children were tested under quiet (45-55 decibel), average (55-70 decibels), and noisy (75-90 decibels) conditions. It was hypothesized that subjects would perform better under quiet than under average or noisy conditions, and that boys would be more detrimentally affected by noise than girls. Both white noise and noise typical of that experienced in schools were used. Results indicate that noise had no effect, either detrimental or facilitating, upon either speed or accuracy of performance.

2. Major implications for a definition of teaching: Since this study focused only upon the effects on noise upon performance, no implications for defining teaching can be advanced.

3. Major implications for studying teaching: Subjects were 129 male and 134 female 7th grade school children. These students were then divided into groups which were roughly equal in the following dimensions: IQ, socio-economic status, scholastic achievement, and performance on an alternate form of the STEP Reading Test. All groups were then administered the STEP Reading test while exposed to varying levels of noise (low, medium, or high), and varying types of noise (regualr classroom or white).

4. Categories:

   Noise conditions: Both the quantity and quality of noise was controlled. Noise quantity was divided into three levels: low (45-55 decibels); medium (55-70 decibels); and high (75-90 decibels). Noise quality was either that typically experienced in classrooms or white.

   Pupil Performance: It was determined by speed and accuracy on the STEP Reading Test, Form 3.

5. The nine elements:

   1. Students: Students' performance was unaffected by either the amount or quality of noise.

   6. Place: The level and type of noise existent in classrooms had no effect upon pupil performance.

   7. Task: The task used in this study - the STEP Reading Test - was unaffected by experimental manipulation.

6. Description of the study:

a) Behavior: Students were administered the STEP Reading Test while exposed to varying degrees and types of noise; all behaviors must, therefore, be considered manipulated.

b) Setting: All tests were administered in classroom settings; however, none of these classrooms were those to which the subjects were typically assigned. Furthermore, half of the subjects were tested in empty classrooms (white noise condition), and half were tested in the presence of other students (classroom noise condition).

c) Treatment: Subjects' performances on the STEP Reading Test while exposed to varying degrees and types of noise were studied.

d) Data collection: All data were based upon subjects' speed and accuracy in performing the STEP Reading Test, Form 3.

e) Data analysis: Means and standard deviations were compared across conditions, and two-way analysies of variance were performed on the data for both speed and accuracy.

--Reviewed by Tom McDonnell

Source: Sommer, R. Classroom layout. Theory into Practice, 1977, 16, 174-175.

1. Summary: This review focuses upon the arrangement and use of space as parts of the non-verbal communications system of the classroom. Traditionally, classroom arrangement has been under the direct control of the teacher and, as such, may be viewed as a direct reflection of his or her educational philosophy and goals. Students, on the other hand, affect the physical environment primarily through their use of it. It is, therefore, suggested that the physical artifacts of a classroom are more revealing of teachers' attitudes and beliefs than of students.

   One obvious weakness in this traditional approach to classroom design is that students have very little voice in matters concerning their educational setting. This may cause alienation and indifference. Various alternative approaches to classroom design are discussed, including asking students directly about the physical environment and allowing them to arrange classrooms as they please. Both approaches are intended to increase students' control over the environment and further involve them in the educational process.

   Various classroom arrangements are discussed in relation to the type of study to which they are most conducive. Straight row arrangements are viewed as best for "sit-and-listen" teaching, cluster tables for group learning. One-teach-one methods of instruction are best served by two person tables, whereas manipulative activities often require long tables to display and use materials. It is suggested that students and teachers experiment with different arrangements, and that class design be individualized to the needs of the students.

2. Major implications for a definition of teaching: Teachers are urged to be more responsive to both their own educational philosophy and to the individual needs of the students.

--Reviewed by Tom McDonnell

Source: Sommer, R. and Becker, F. Learning outside the classroom. School Review, 1974, 82, 601-607.

1. Summary: The authors distinguish "teaching" environments - which are characterized by fixed time-space coordinates with both implicit and explicit behavioral norms - from "learning" environments - which are characterized by *a plethora of interesting, novel, and useful* objects which are designed to be manipulated, measured, arranged, and experienced. The authors also compare definitions of "learning" offered by students in an undergraduate psychology class to those offered by participants in four off-campus field learning situations. It was found that those definitions from the classroom were abstract, impersonal and passive, whereas those from the field were characterized by an active personal involvement with the environment. It is suggested that as we become more fully aware of the relative advantages afforded by these environments, we can better decide what can best be learned in each.

2. Major implications for a definition of teaching: Effective teaching requires some decision as to which type of environment is best suited to the purposes of the class and the implementation of that.

3. Major implications for studying teaching: The authors asked undergraduates enrolled in an introductory psychology class, and undergraduate participants in four field study placements to describe the nature of "learning" within their setting. These descriptions were then compared so as to determine how setting affects one's conceptualization of learning.

4. Categories:

   Teaching environments are similar to those typically found in classrooms. The emphasis is upon the passive absorption of knowledge. Time-space coordinates are fixed and there are both implicit and explicit behavioral norms. Desks are arranged so as to maximize attention to the teacher and minimize group interaction and self-exploration.

   Learning environments are those in which participants actively structure their own experience. Group interaction and self-exploration are encouraged and there is an abundance of objects which the student is encouraged to manipulate and learn.

   Learning was defined by subjects' responses to the question, "What constitutes learning in this environment?"

5. The nine elements:

1. Students: Students' degree of involvement and perceptions of learning are strongly affected by environment. In teaching environments, they tend to be passive learners, and define learning in abstract and impersonal terms whereas in learning environments, they are active participants and tend to define learning in concrete and personal terms.

4. Role: The degree to which students are encouraged or discouraged from actively interacting with elements within the environment influences not only their degree of involvement, but also their perceptions of the learning process.

6. Place: Traditonal classrooms tend to foster a "teaching environment" approach to learning whereas field placements typically foster a "learning environment" approach.

7. Task: The degree to which students actively engage in the exploration of their environment and physically interact with learning materials strongly affects their perceptions of the learning process.

8. Standards and sanctions: In environments in which students are expected to "sit and listen", learning is viewed as an impersonal and abstract entity. In environments in which they are encouraged to explore learning, the view is personal and concrete.

9. Communication: The degree to which students are encouraged to freely communicate their ideas with one another significantly affects their perceptions of the learning process.

6. Description of the study:

a) Behavior: All subjects were asked to describe "learning" within the context of their current educational setting.

b) Setting: All subjects were enrolled in either an introductory psychology class, or in one of four field study placements.

c) Treatment: The degree to which setting influenced subjects' descriptions of learning was the event studied.

d) Data collection: All subjects were asked to describe "learning" within the context of their current educational setting.

e) Data analysis: No methods of data analysis were described.

--Reviewed by Tom McDonnell

Source: Rawls, J.R., Tregi, R.E., McGaffey, C.W., and Rawes, D.J. Personal space as a predictor of performance under close working conditions. Journal of Social Psychology, 1972, 86, 261-267.

1. Summary: Two experiments are described which examined the relationship between personal space preference and task performance under crowded conditions. In the first study, 56 male undergraduates with varying personal space preferences were tested on three different psychomotor tasks taken from Moran's Repetitive Psychological Measures. All subjects were administered the tests while seated at a 2.5' x 5' table in groups of two, four, and eight. Results indicate that the overall performances of those subjects with low personal space preferences were unaffected by crowding conditions. However, the overall performances of those subjects with high personal space preferences tended to decrease as the degree of closeness increased.

   In the second study, 48 male college students with varying personal space preferences were given a modified version of the number facility task from Moran's Repetitive Psychological Measures test. Groups of two and eight were tested while seated around a 2.5' x 5' table. The test was divided in half so that all subjects were tested under both conditions. Results indicate that subjects in the upper half of the personal space distribution worked more arithmetic problems and got more correct answers than did subjects in the lower half of the personal space distribution, regardless of the conditions of closeness. It was also found that subjects, in general, worked more problems under the eight-subject than under the two-subject condition. The authors conclude, however, that this is largely attributable to the increase in number of problems worked under the eight-subject condition by the lower scores on the personal space measure rather than an overall increase for both groups. It was also determined that high personal space scorers worked best under the two-subject condition, whereas low personal space scorers worked best under the eight-subject condition.

2. Major implications for a definition of teaching: Since this study did not focus on the teacher, no implications for defining teaching can be drawn.

3. Major implications for studying teaching: Personal space preference was assessed by asking subjects to walk toward a stationary person until they reached a distance from which they would feel comfortable in engaging in social interaction. This distance was then measured and recorded. For the remainder of the study, a typical experimental design was employed in which the number of persons sitting at the table (crowdedness) was the independent variable and performance on various subtests of Moran's Repetitive Psychological Measures was the dependent variable.

4. Categories:

   Personal space was defined as the area surrounding an individual beyond which the majority of his interactions take place.

Personal space preference was defined as that amount of distance a subject left between himself and a stationary person when asked to approach that person for social interaction.

Performance was defined in terms of subjects' scores on various subtests of Moran's Repetitive Pschological Measures.

Crowdedness was defined by the number of persons seated around a 2.5' x 5' table.

5. The nine elements:

   1. Students: Students' performances were found to vary with the degree of crowdedness. It was also found that students' personal space preferences significantly affected the relationship between performance and crowdedness.

   6. Place: The extent to which subjects were placed in crowded environments was found to significantly influence task performance.

   7. Task: Task performance was found to be dependent upon both the degree of crowdedness and by subjects' personal space preferences.

6. Description of the study:

   a) Behavior: Task performance under varying conditions of crowdedness was studied; therefore, all behaviors must be considered manipulated.

   b) Setting: All tests were administered in psychology laboratories at Texas Christian University. In each lab were placed a 2.5' x 5' table and from two to eight chairs.

   c) Treatment: Subjects of varying personal space preferences were exposed to varying degrees of crowdedness while taking various subtests of Moran's Repetitive Psychological Measures test.

   d) Data collection: Personal space preference was determined by measuring the amount of distance each subject left between himself and a stationary figure when he was instructed to approach that person for social interaction. All other performance measures were based upon subjects' responses to various subtests on Moran's Repetitive Psychological Measures test.

e) Data analysis:

Study #1: Sign tests were used to determine the effects of personal space perference and crowdedness upon task performance.

Study #2: The data were initially analyzed by two-way classification repeated measures analyses of variance. Then, in order to compare a group of 12 high personal space scorers and a group of 12 low personal space scorers, t-tests were used.

--Reviewed by Tom McDonnell

Source: Willems, E. Sense of obligation to high school activities as related to school size and marginality of student. Child Development, 1967, 38, 1247-1260.

1. Summary: Two field studies, conducted in 1961 and 1965, which examined the effects of school size and marginality of student upon students' sense of obligation to non-class school activities are described. Results indicate that the number of students available per activity--a close correlate of school size--had no effect upon regular (well-suited) students. This was especially clear when their reports of sense of obligation were statistically controlled for frequencies of actual participation in positions of leadership in activities. Among marginal students--those selected for relatively poor suitability for school and its affairs--a very different set of results emerged. In small schools, where there were relatively few students available for activities, these students reported a sense of obligation that was similar in magnitude to their regular schoolmates. In large schools, however, such students tended to report little, if any, sense of obligation.

2. Major implications for a definition of teaching: Since these studies focus only upon students, their implications for teachers must be considered tentative at best; however, it does appear that teachers can maximize students' sense of obligation to school by providing a sufficient number of extra curricular activities so that the ratio of students to activities remains low.

3. Major implications for studying teaching: The design for both studies was orthogonal and two-by-two, with the following variables: a) marginal and regular students in b) large and small schools. Self reports on sense of obligation to non-class school activities were obtained from 40 students in 1961 and 80 students in 1965, with equal numbers of subjects per cell in both cases.

4. Categories:

   A. School size: Although no official guidelines were described for determining a school's classification as either large or small, all schools used tended to fall neatly into one category or the other. In both large schools sampled, the junior class consisted of over 700 students and the students/activities ratio exceeded 300. Small schools in both studies had junior classes averaging below 30 students and a students/activities ratio of under 5.

   B. Student marginality: Marginal students were defined as those who had: a) IQ's below 99; b) two grades of "D" or lower the previous semester; c) fathers in non-professional and non-managerial occupations; d) fathers who did not finish grade 10; and e) mothers who did not finish grade 12.

Regular students were defined as those who had: a) IQ's above 105; b) no grades lower than "C" the previous semester; c) fathers who had completed grade 10; and e) mothers who had completed grade 12.

C. Sense of obligation: Sense of obligation was defined as the personal feeling of "I ought to---" or "I must ---", that is, a personal feeling of constraint with reference to attending, participating in, or helping with a group activity. A score believed to reflect students' general sense of obligation to such activities was determined by the total number of such responses given during questioning on a variety of school related activities.

5. The nine elements:

1. Students: Students' sense of obligation to non-class activities was found to vary according to both size and student marginality. Although school size did not affect sense of obligation among regular students, it had a profound effect upon marginal students. These students tended to have a similar sense of obligation to regular students in small schools; in large schools, however, marginal students tended to report very little sense of obligation.

6. Place: The size of the school--as reflected by the students/activities ratio--has a profound effect upon marginal - but not regular - students' sense of obligation to non-class activities. In general, marginal students tend to report a greater sense of obligation when they are enrolled in small, as opposed to large, schools.

Description of the study:

a) Behavior: The behavior studied was students' sense of obligation to non-class school activities. Since no attempt was made to alter this sense, the behavior is best described as natural.

b) Setting: The setting for these interviews was not described. However, since students were responding to their reactions about their non-class school activities, this study can best be described as occurring within the confines of the school.

c) Treatment: The effects of both school size and student marginality upon sense of obligation to non-class school activities was examined.

d) Data collection: Students were asked to describe their reasoning for participating in or abstaining from five preselected school activities. Independent judges then analyzed these unlabeled protocols and assigned each student a score based upon the number of sense of obligation responses given.

e) Data analysis: A two-by-two analysis of variance was employed in each study to determine the effects of a) student marginality and b) school size upon sense of obligation to non-class school activities.

Reviewed by Tom McDonnell

Source: Worchel, S. and Teddlie, L. The experience of crowding: A two-factor theory. Journal of Personality and Social Psychology, 1976, 34, 30-40.

1. Summary: The authors propose a two-step process for the experience of crowding. First, individuals become aroused by violations of their personal space; second, they attribute this arousal to other people in their environment. Based upon this model, it was predicted that the experience of crowding can be reduced if individuals are distracted from making the attribution that their arousal is caused by other persons.

   In order to test this hypothesis, 315 male introductory psychology students were asked to complete a performance test, a human relations problem, and a 20-item questionnaire pertaining to their attraction toward fellow group members. They performed these tasks in rooms that varied in both interaction distance and density. Additionally, in half of the conditions, pictures (attribution inhibitors) were placed on the walls of the experimental room whereas in the other half,the walls were bare. Data were then examined so as to assess the effects of these three variables in the following: the experience of crowding; stress; perception of the experimental room; performance; punitiveness; and ratings of other group members. Results indicate that interaction distance is more closely related to each of these variables than density and that the addition of pictures reduces the experience of crowding, alleviates stress, results in more positive evaluations of the setting, encourages less punitiveness, and is related to a more positve impression of fellow group memebers. It was concluded that these results support the attribution theory of crowding.

2. Major implications for a definition of teaching: Since this study did not examine teacher behaviors, no implications for defining teaching can be drawn. However, it does appear that the incorporation of pictures and other distractors can help teachers minimize the effects of crowding.

3. Major implications for studying teaching: Room density was varied by testing subjects in groups of 7 and 8 in either 12.5' x 9' or 20.5' x 11.5' rooms. Interaction distance was varied by arranging subjects' chairs in a circle so that their front legs either touched (close interaction distance condition), or were 19.5" apart (far interaction distance condition). In addition, the extent to which subjects were distracted from attributing their arousal to the presence of other people was varied by testing subjects in rooms with and without pictures. All data were based upon subjects' responses to three tasks: 1) forming as many words as possible from the master word "industriously"; 2) assigning one of seven possible punitive actions to a hypothetical juvenile delinquent; and 3) completing a 20-item questionnaire pertaining to their reactions to the experiment and their attraction to fellow group members.

4. Categories:

Room density was determined by both the size of the room and the number of people in it. The highest density condition involved placing 8 people in a 12.5' x 9' room, whereas the lowest density condition involved placing 7 people in a 20.5' x 11.5' room.

Interaction distance was determined by how close subjects were seated to one another. In the close interaction distance condition, the front legs of subjects' chairs touched one another, whereas in the far interaction distance condition 19.5" of space separated them.

Attribution inhibitors were pictures placed on the walls of the experimental room.

Performance was determined by how many words a subject could form from the master word "industriously".

The experience of crowding was determined by subjects' responses to questions pertaining to how comfortable, confining, and crowded they found the experimental room.

Stress was determined by how long subjects estimated that each experimental task had lasted. It was hypothesized that gross over-estimates would be indicative of stress. Stress was also determined by how many names of group members subjects could recall and by whether they reported the emergences of group leaders. The authors hypothesized that those subjects who experienced stress in the experiment would recall few names and would be likely to report the emergence of one or more group leaders.

Room perception was determined by subjects' responses to questions pertaining to how pleasant they found the experimental room.

Punitiveness was determined by subjects' choice of punishment for a hypothetical juvenile delinquent.

Evaluation of fellow group members was based upon subjects' responses to written inquiries regarding their attraction to other group members.

5. The nine elements:

    1. Students: Students' performances, punitiveness, experience of crowding, stress and evaluations of the setting and of other group members were significantly affected by room density, interaction distance, and the presence or absence of pictures.

    6. Place: Both room density and interactive distance were found to significantly affect subjects' experience of crowding. Additionally, it was found that the presence of pictures can significantly reduce subjects' experience of crowding.

    7. Task: Subjects' performances on a word formation task were significantly affected by the experience of crowding.

6. Description of the study:

    a) Behavior: All behaviors were manipulated. Students were asked to perform a word formation task and to respond to a variety of inquiries under conditions that varied along three dimensions: 1) room density, 2) interaction distance, and 3) presence or absence of pictures on the wall.

    b) Setting: All data were collected in laboratories. These laboratories varied in terms of size (12.5' x 9' or 20.5' x 11.5'), interaction distance, and as to whether they had pictures on the wall.

    c) Treatment: Students' performances, room perception, punitiveness, stress, interpersonal perception, and experience of crowding under varying conditions of crowding were studied.

    d) Data collection: All data were based upon subjects' performances on a word association task and their responses to various questionnaires.

    e) Data analysis: The authors report that all data were analyzed through a "...series of analyses of variance." No additional details are given.

--Reviewed by Tom McDonnell